T-04003 FIGS. 1-32

OBLON, SPIVAK, ET AL
DOCKET #: 250084US2
INV: Keiichi SATOH, et al.
SHEET 1 OF 34

FIG. 1

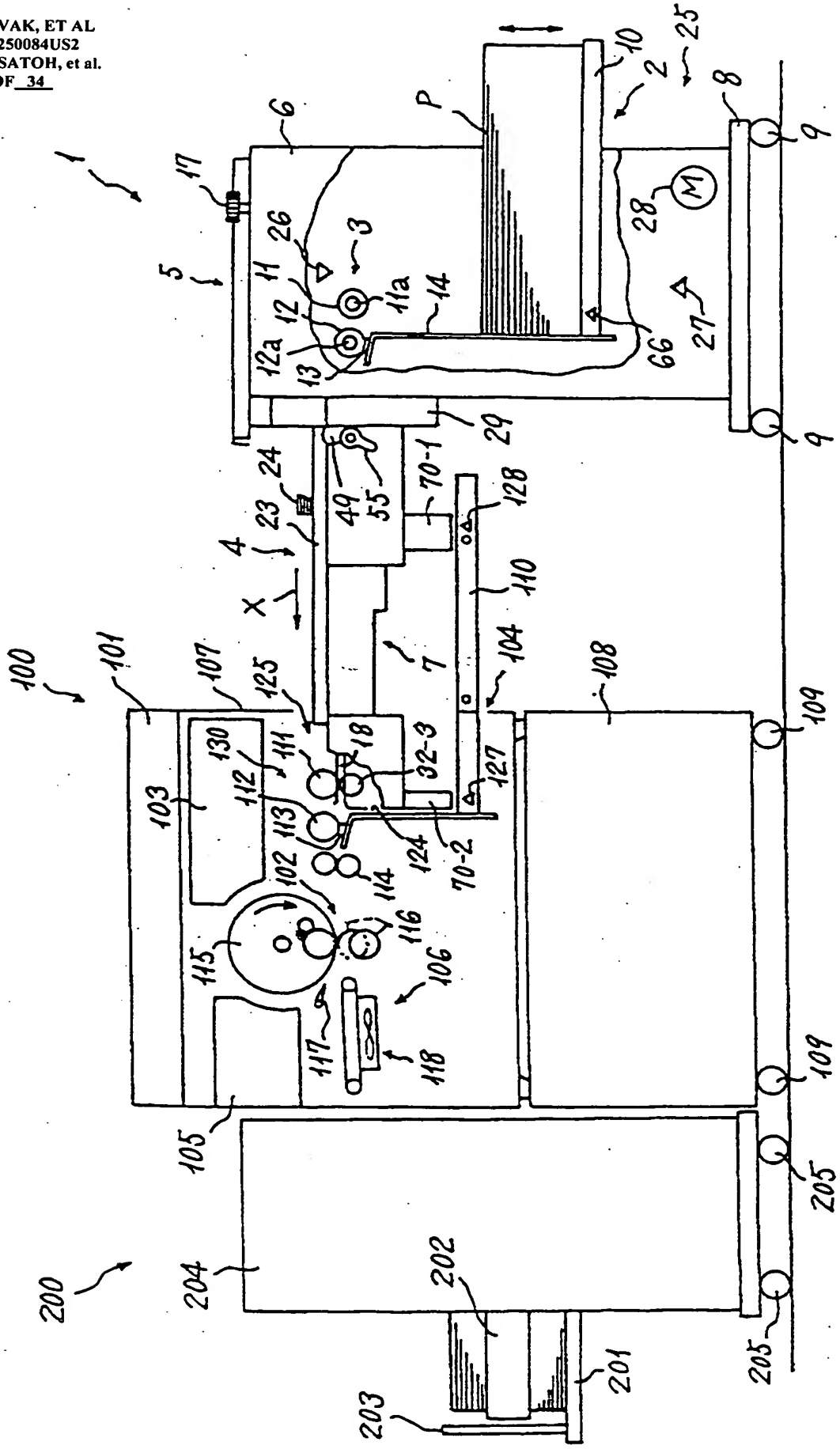


FIG. 2

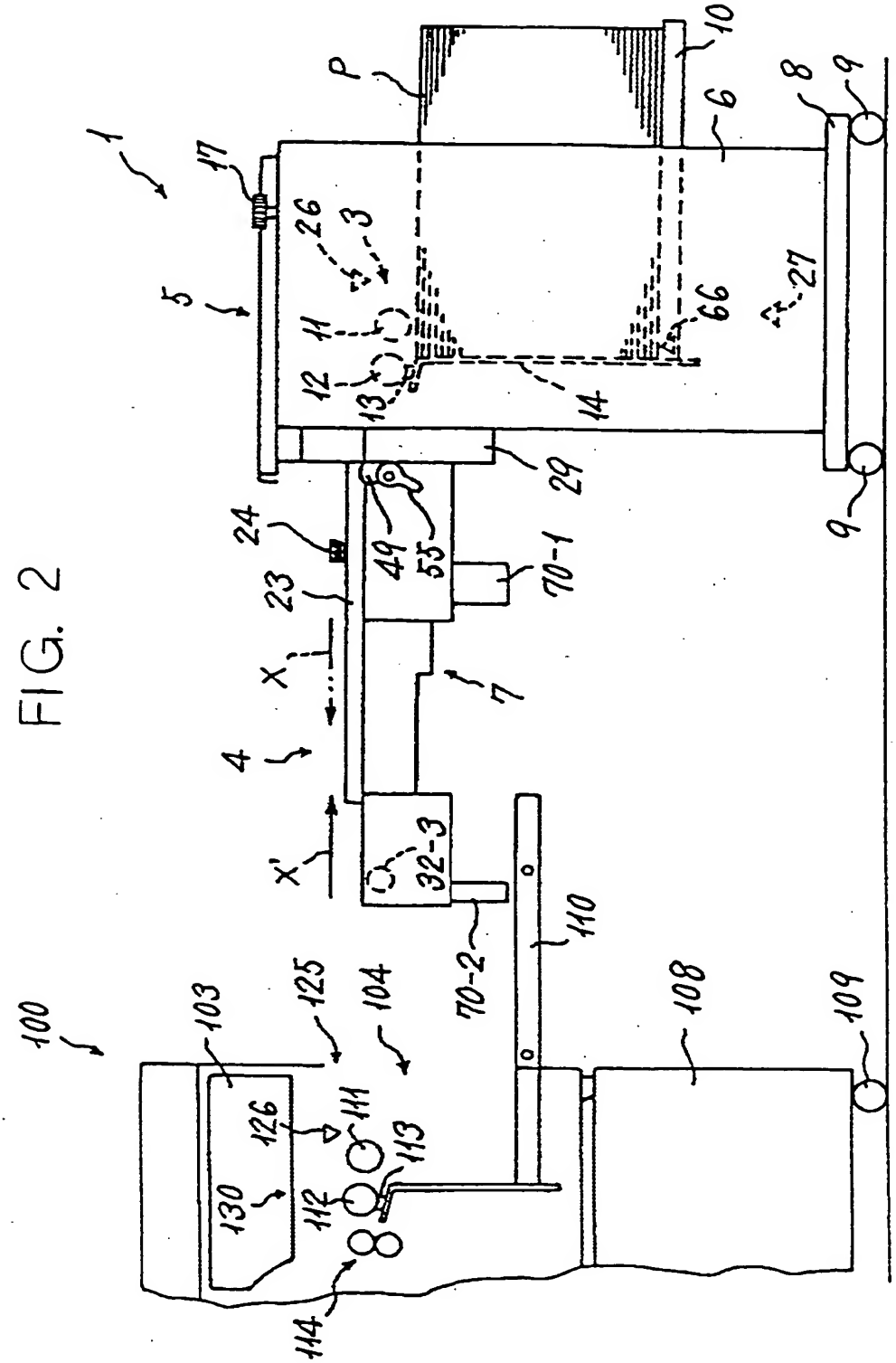

1
P
10
6
8
9
17
26
3
5
27
66
11
12
13
14
29
24
49
55
70-1
23
X
7
4
X'
32-3
110
70-2
100
103
125
104
108
109
126
111
113
130
112
114

FIG. 3

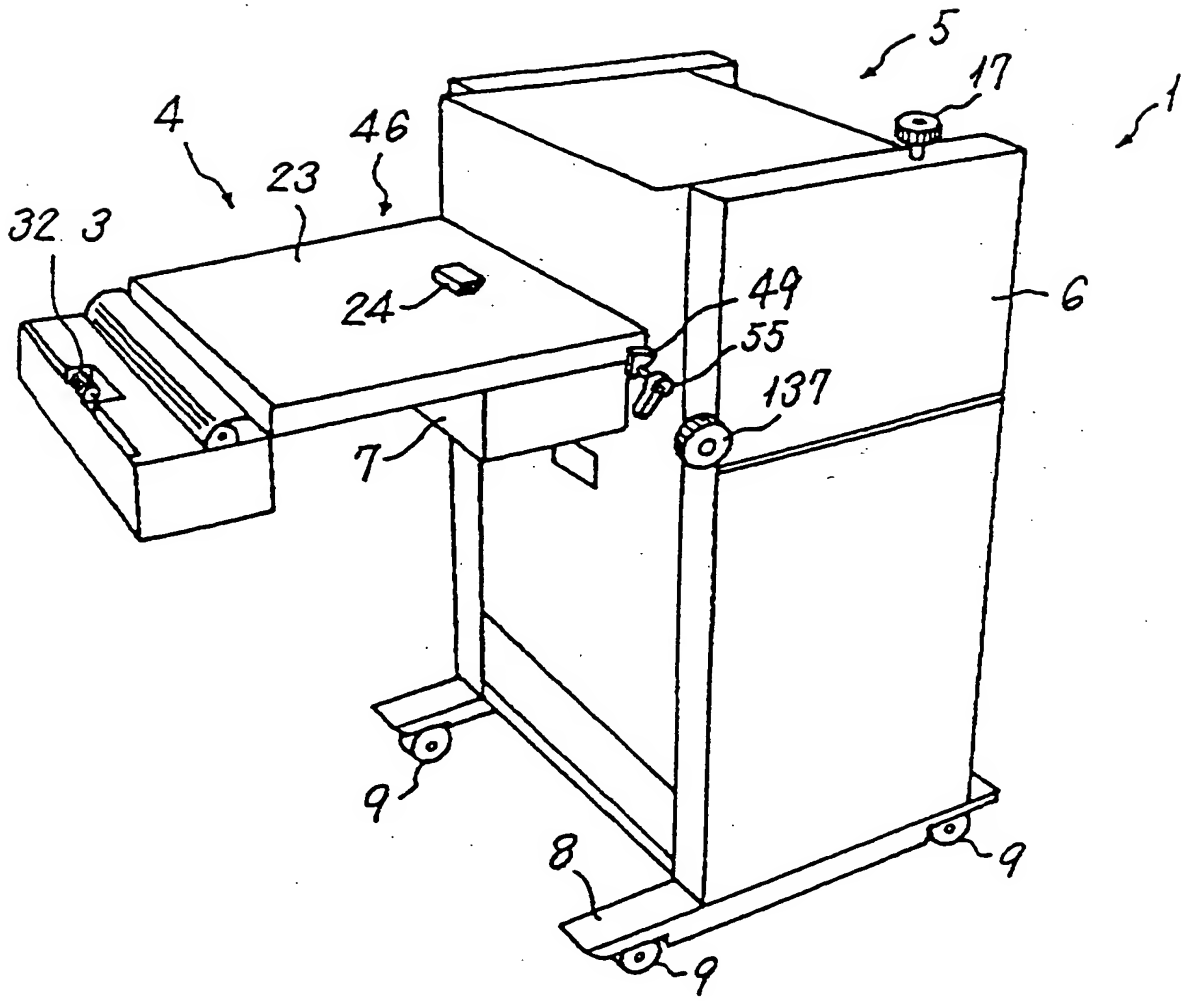
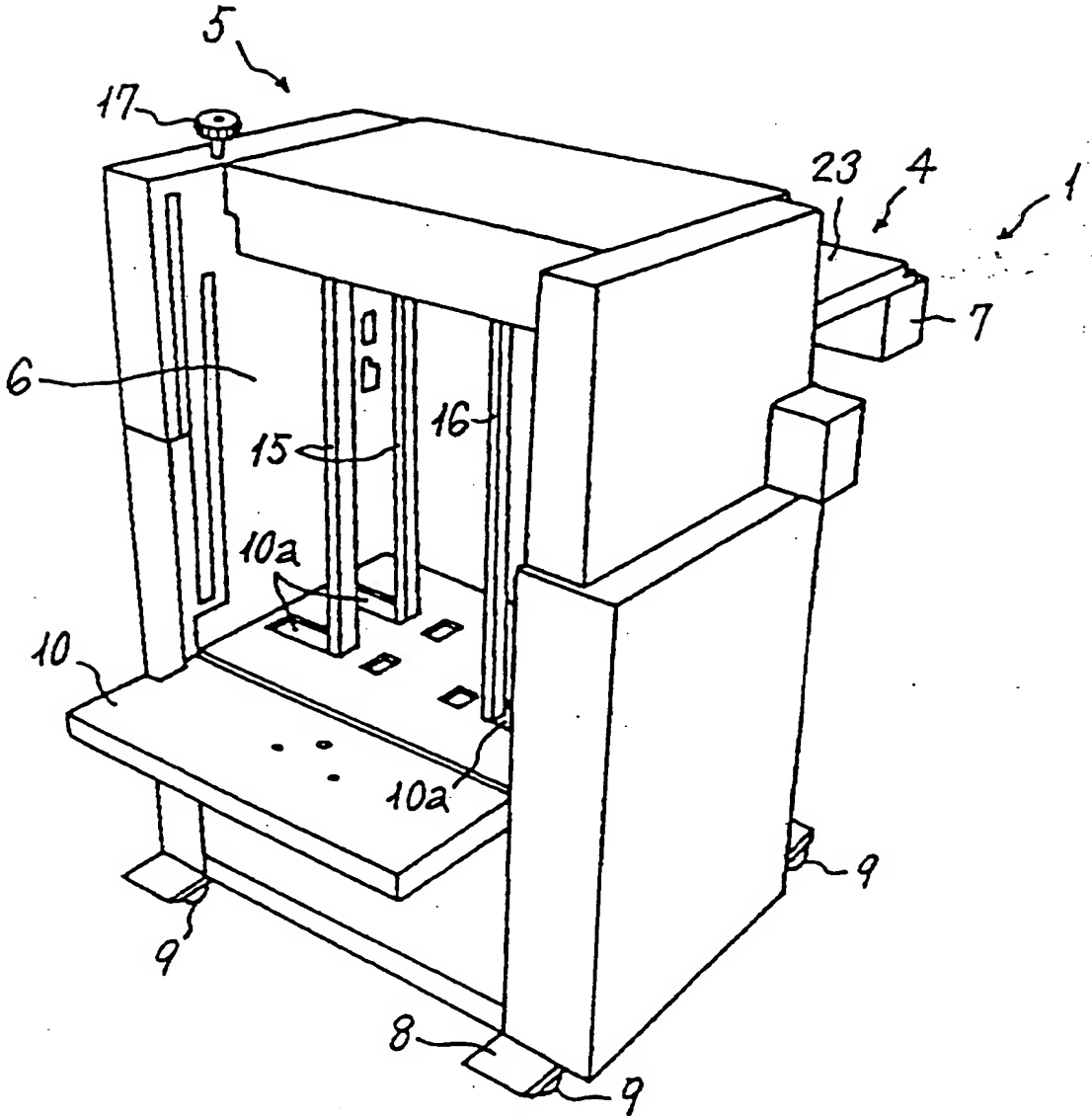


FIG. 4



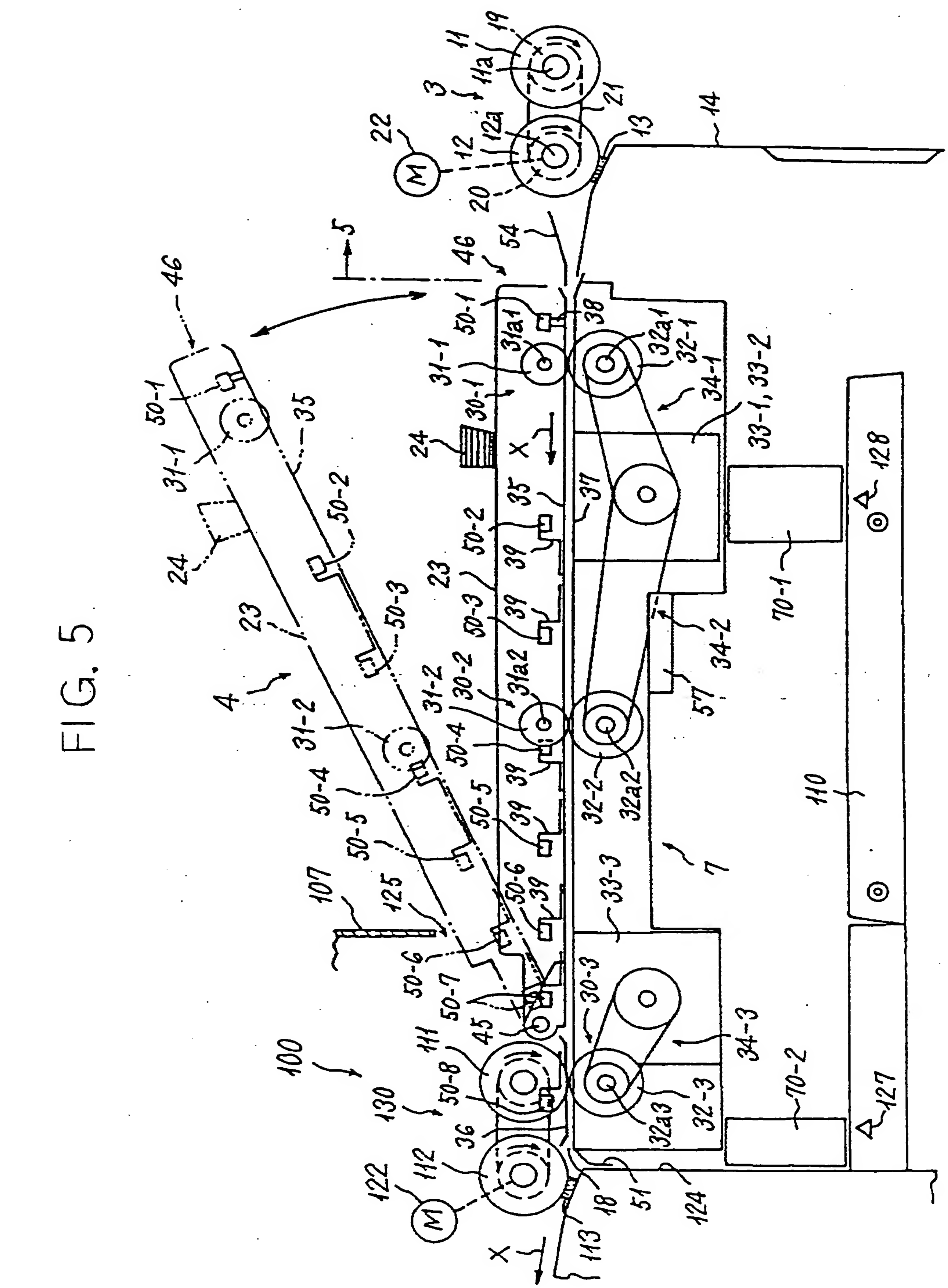


FIG. 5

FIG. 6

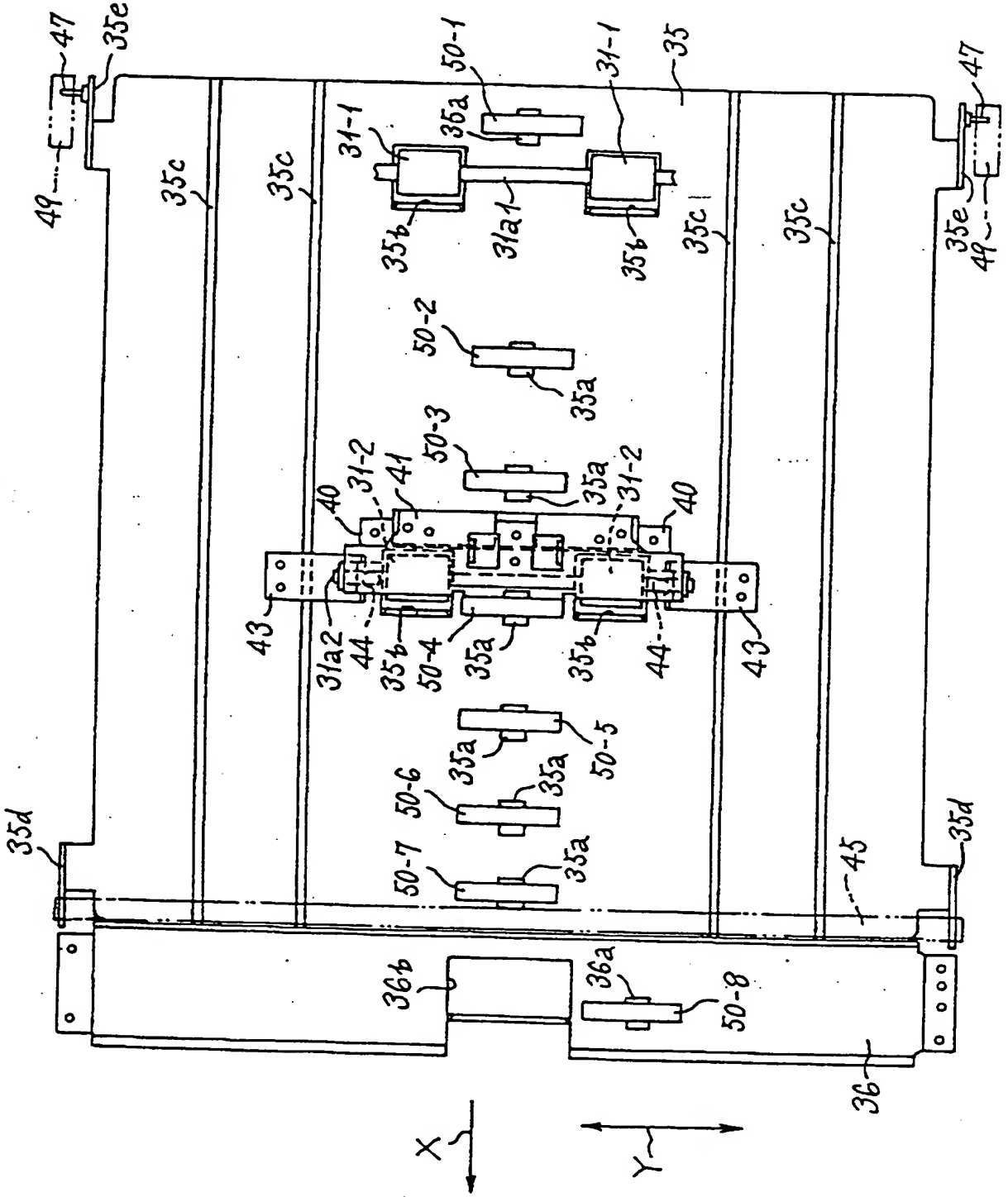

47
35e
49
35c
35c
31-1
50-1
35a
31-1
35
47
35b
31a1
35b
35c
35c
35e
49
50-2
35a
50-3
31-2
41
40
35a
31-2
40
43
31a2
44
35b
50-4
35a
35b
44
43
50-5
35a
35a
50-6
50-7
35a
35d
45
35d
36b
36a
50-8
36
X
Y

FIG. 7

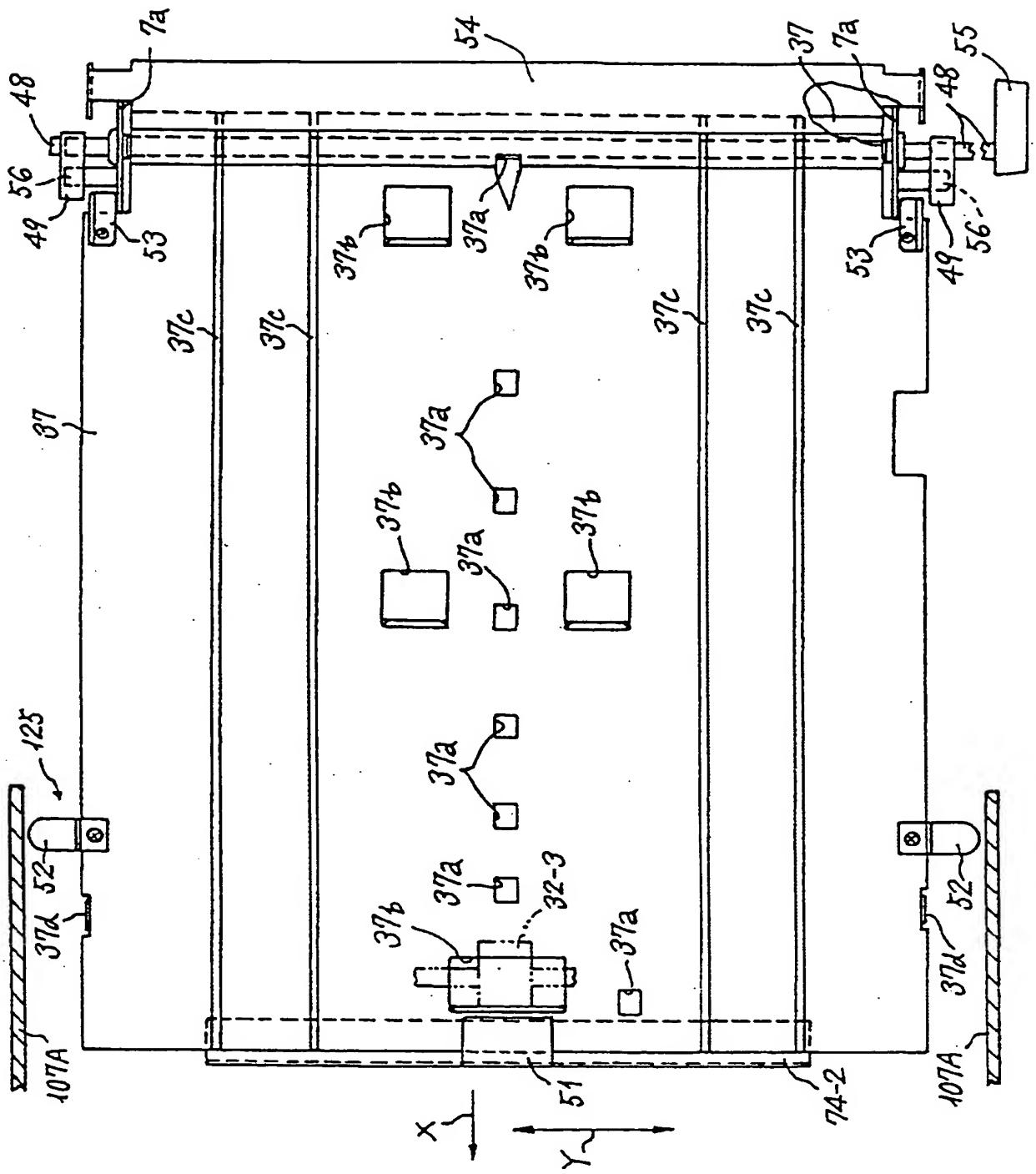

7a
54
37
7a
55
48
48
56
49
53
37b
37a
37b
53
49
56
37c
37c
37c
37c
37
37a
37b
37a
37b
37a
125
37a
52
37d
37b
37a
32-3
37a
52
37d
107A
107A
51
74-2
X
Y

FIG. 8

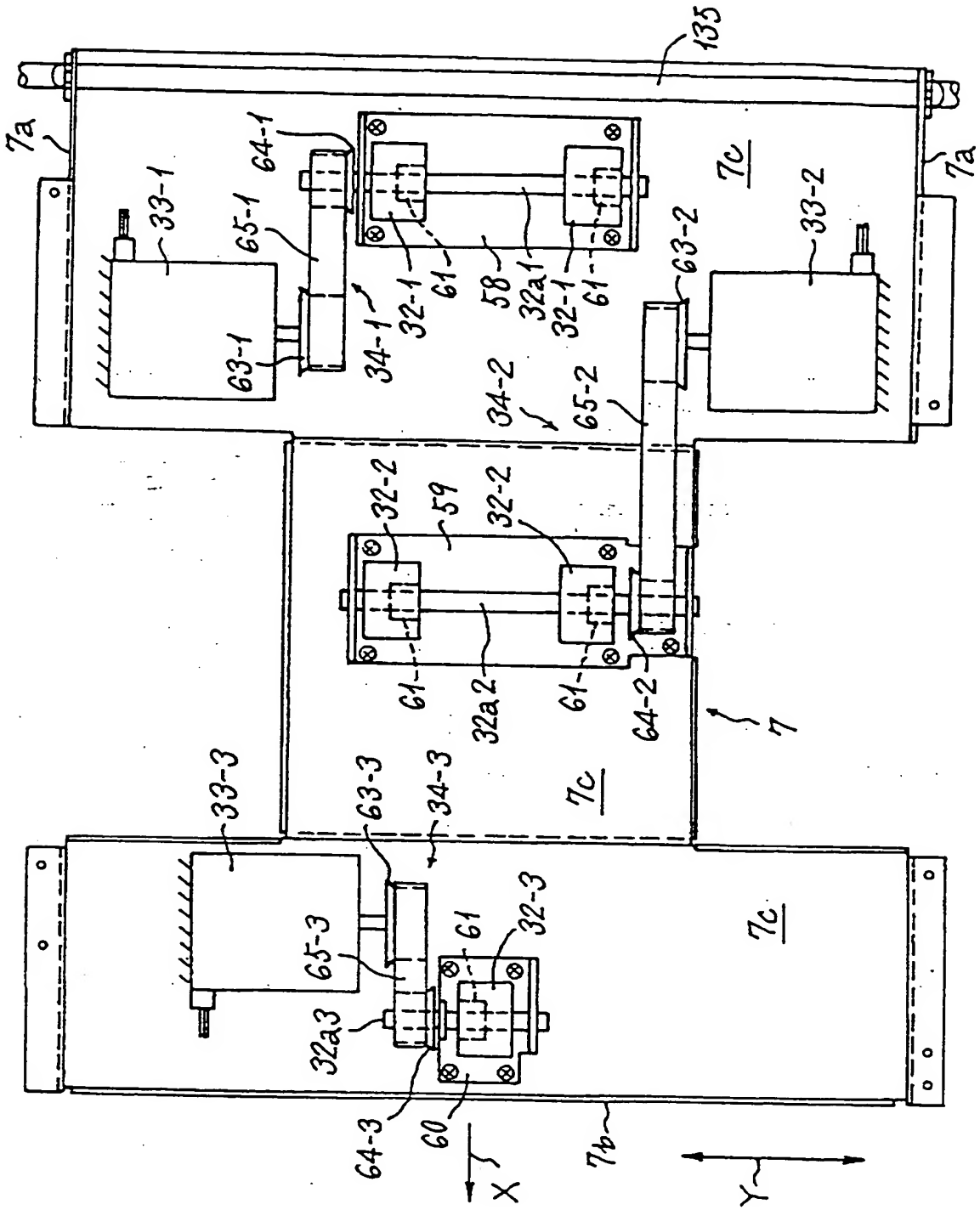

135
7a
7a
64-1
33-1
65-1
63-1
34-1
32-1
61
58
32a1
32-1
61
63-2
33-2
7c
34-2
65-2
32-2
59
32-2
61
32a2
61
64-2
7
33-3
63-3
34-3
7c
65-3
61
32-3
32a3
64-3
60
7b
X
Y
7c

FIG. 9A

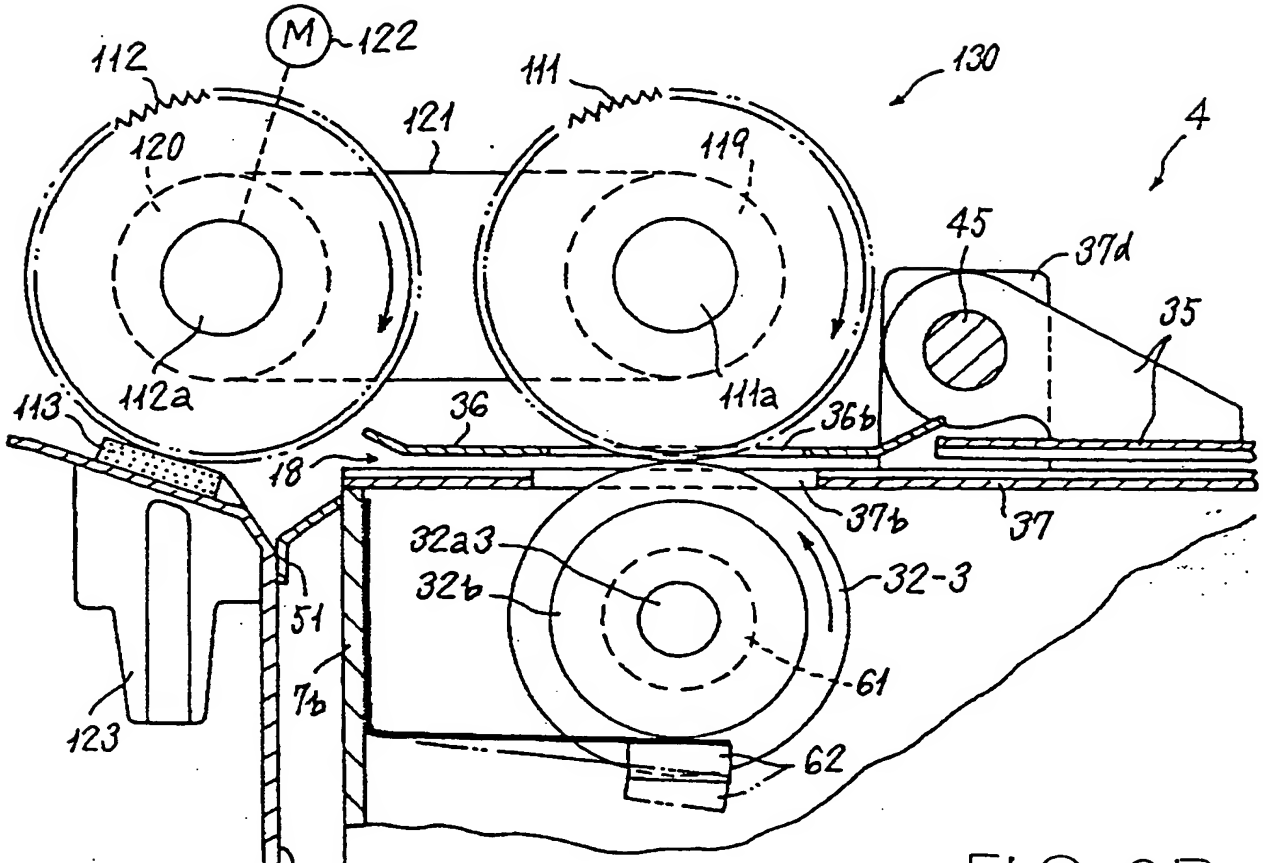

M
122
112
111
130
120
121
119
4
45
37d
35
113
112a
111a
36
36b
18
37b
37
32a3
32b
32-3
51
61
7b
123
62
124

FIG. 9B

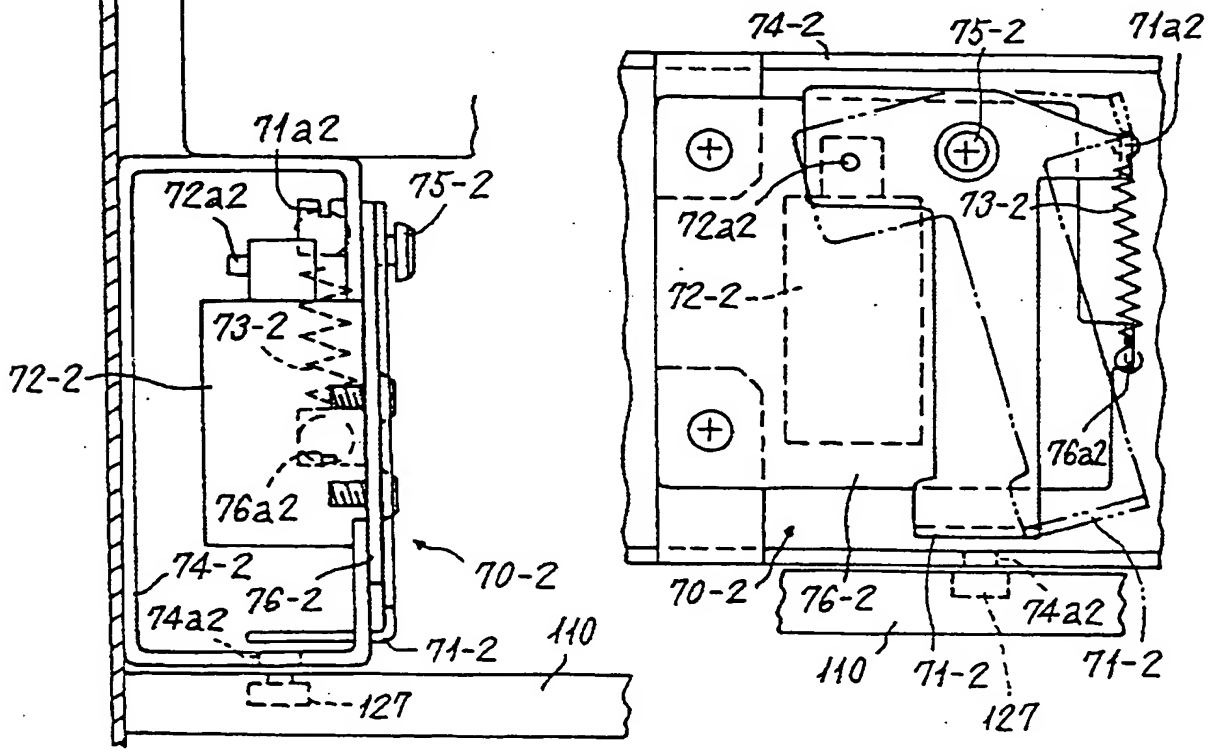

74-2
75-2
71a2
72a2
73-2
72-2
76a2
70-2
74a2
76-2
71-2
110
127

FIG. 10

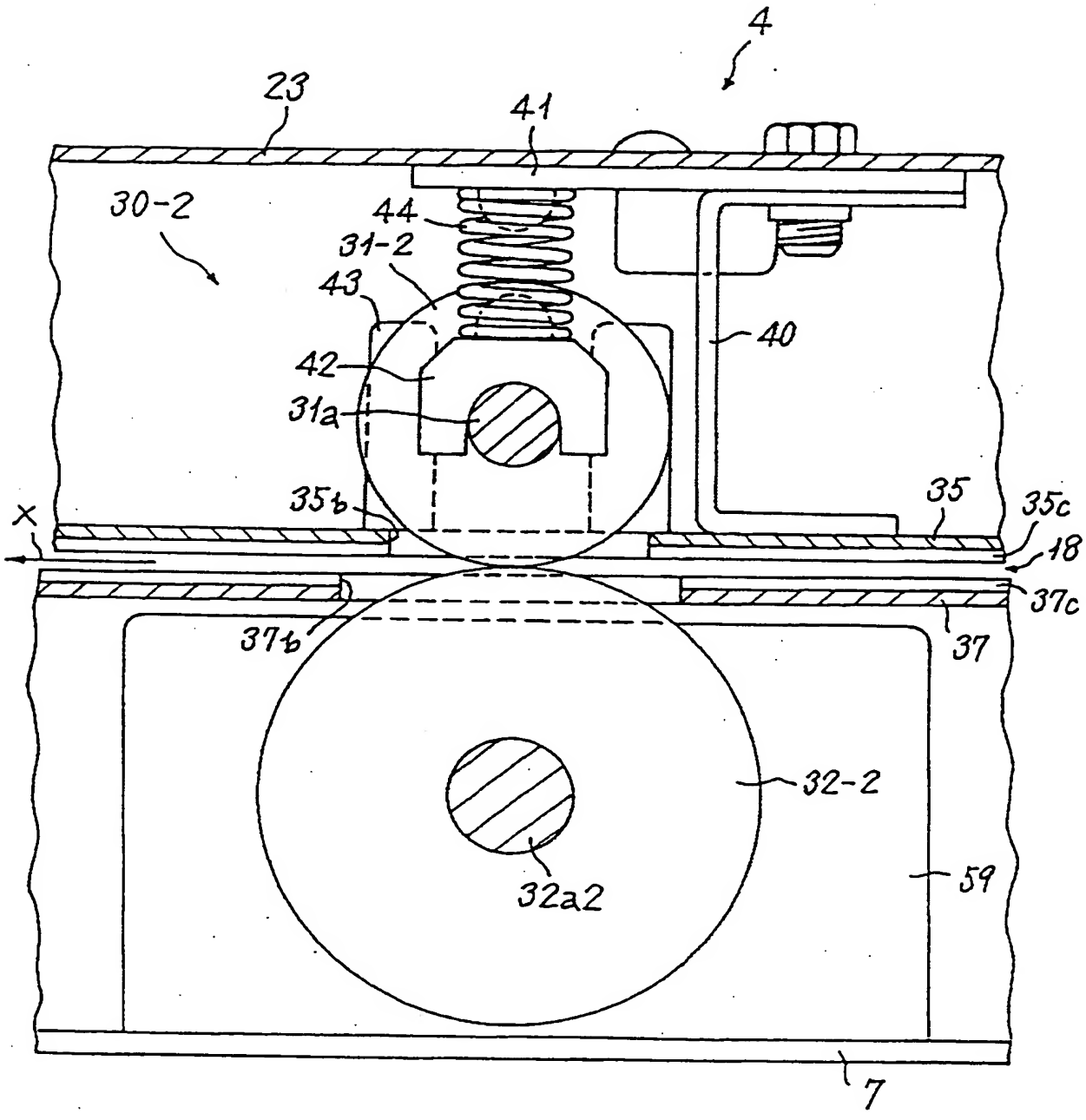

4
23
41
30-2
44
31-2
43
42
31a
40
35b
35
35c
18
X
37c
37b
37
32-2
32a2
59
7

FIG. 11

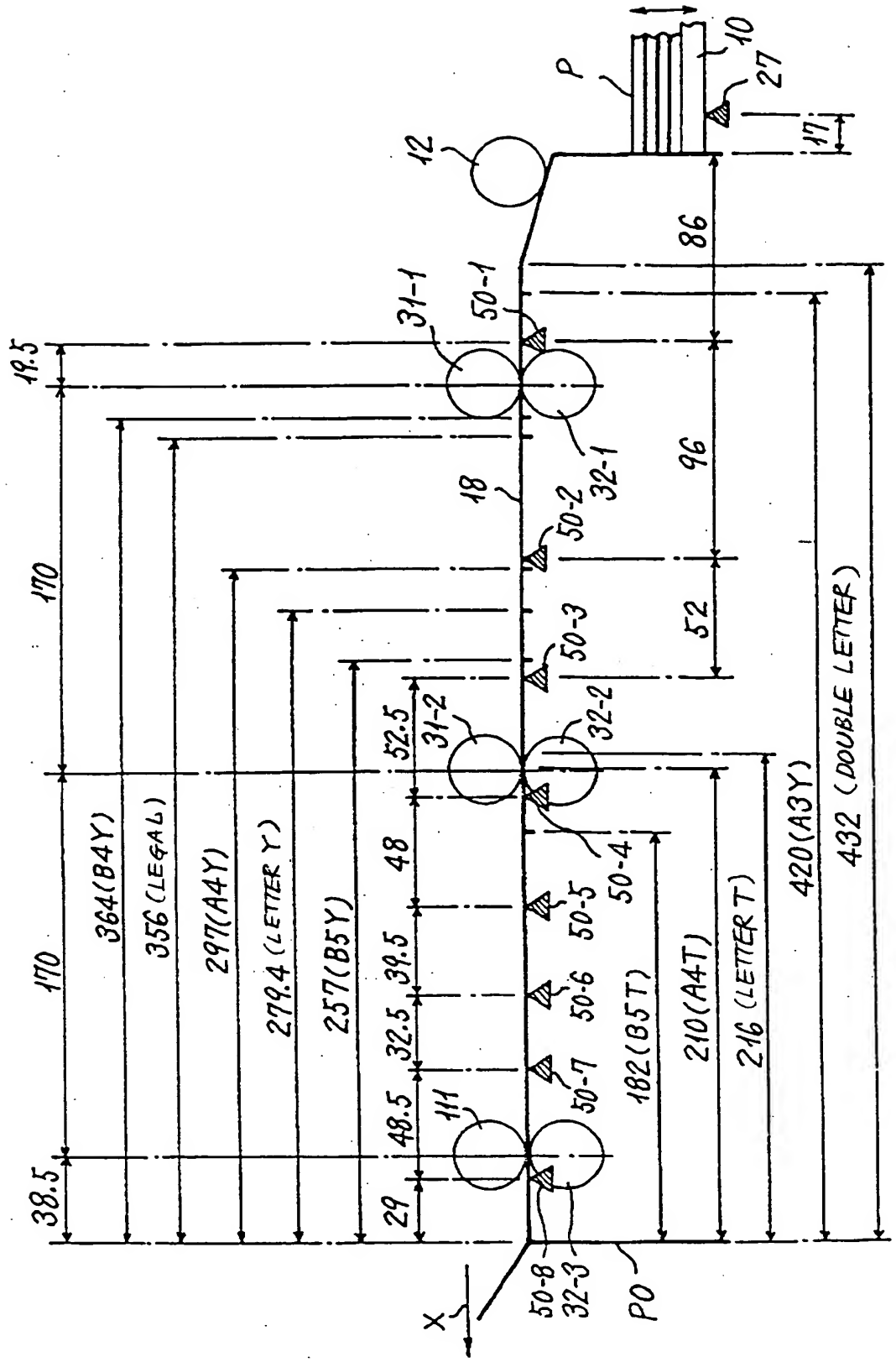

P
10
27
17
12
86
31-1
50-1
19.5
96
18
32-1
50-2
170
52
50-3
52.5
31-2
32-2
48
50-4
39.5
50-5
32.5
50-6
48.5
111
50-7
29
38.5
50-8
32-3
PO
X
364(B4Y)
356(LEGAL)
297(A4Y)
279.4(LETTER Y)
257(B5Y)
182(B5T)
210(A4T)
216(LETTER T)
420(A3Y)
432(DOUBLE LETTER)

FIG. 12

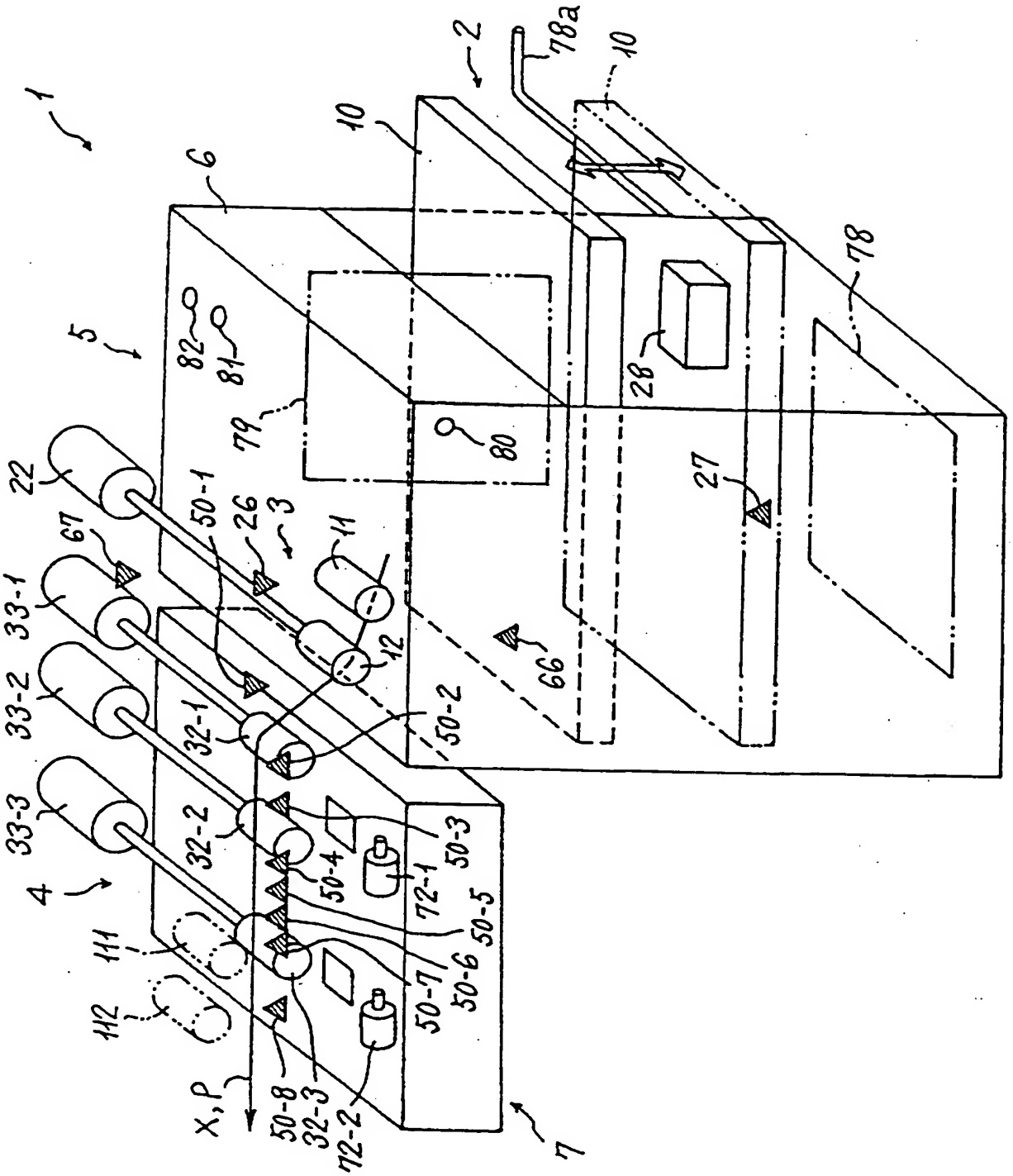
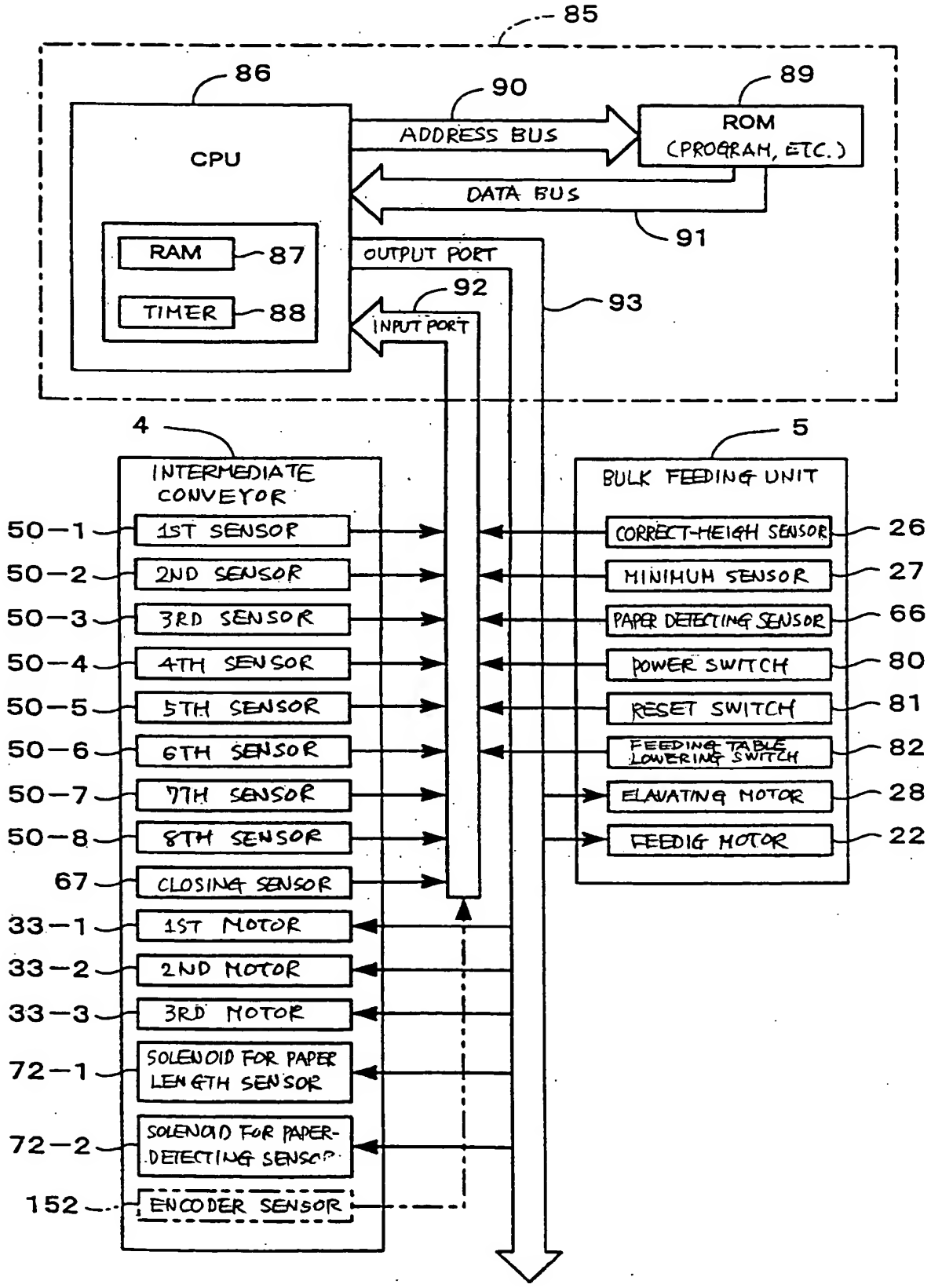

1
2
78a
10
10
6
5
82
81
79
80
28
78
27
22
67
33-1
33-2
33-3
4
111
112
X, P
50-1
26
3
11
12
66
50-2
32-1
32-2
50-4
50-3
72-1
50-5
50-7
50-6
50-8
32-3
72-2
7

FIG. 13


85
86
CPU
RAM
87
TIMER
88
90
ADDRESS BUS
DATA BUS
89
ROM
(PROGRAM, ETC.)
91
OUTPUT PORT
92
INPUT PORT
93
4
INTERMEDIATE CONVEYOR
50-1
1ST SENSOR
50-2
2ND SENSOR
50-3
3RD SENSOR
50-4
4TH SENSOR
50-5
5TH SENSOR
50-6
6TH SENSOR
50-7
7TH SENSOR
50-8
8TH SENSOR
67
CLOSING SENSOR
33-1
1ST MOTOR
33-2
2ND MOTOR
33-3
3RD MOTOR
72-1
SOLENOID FOR PAPER LENGTH SENSOR
72-2
SOLENOID FOR PAPER-DETECTING SENSOR
152
ENCODER SENSOR
5
BULK FEEDING UNIT
CORRECT-HEIGH SENSOR
26
MINIHUM SENSOR
27
PAPER DETECTING SENSOR
66
POWER SWITCH
80
RESET SWITCH
81
FEEDING TABLE LOWERING SWITCH
82
ELAVATING MOTOR
28
FEEDIG MOTOR
22

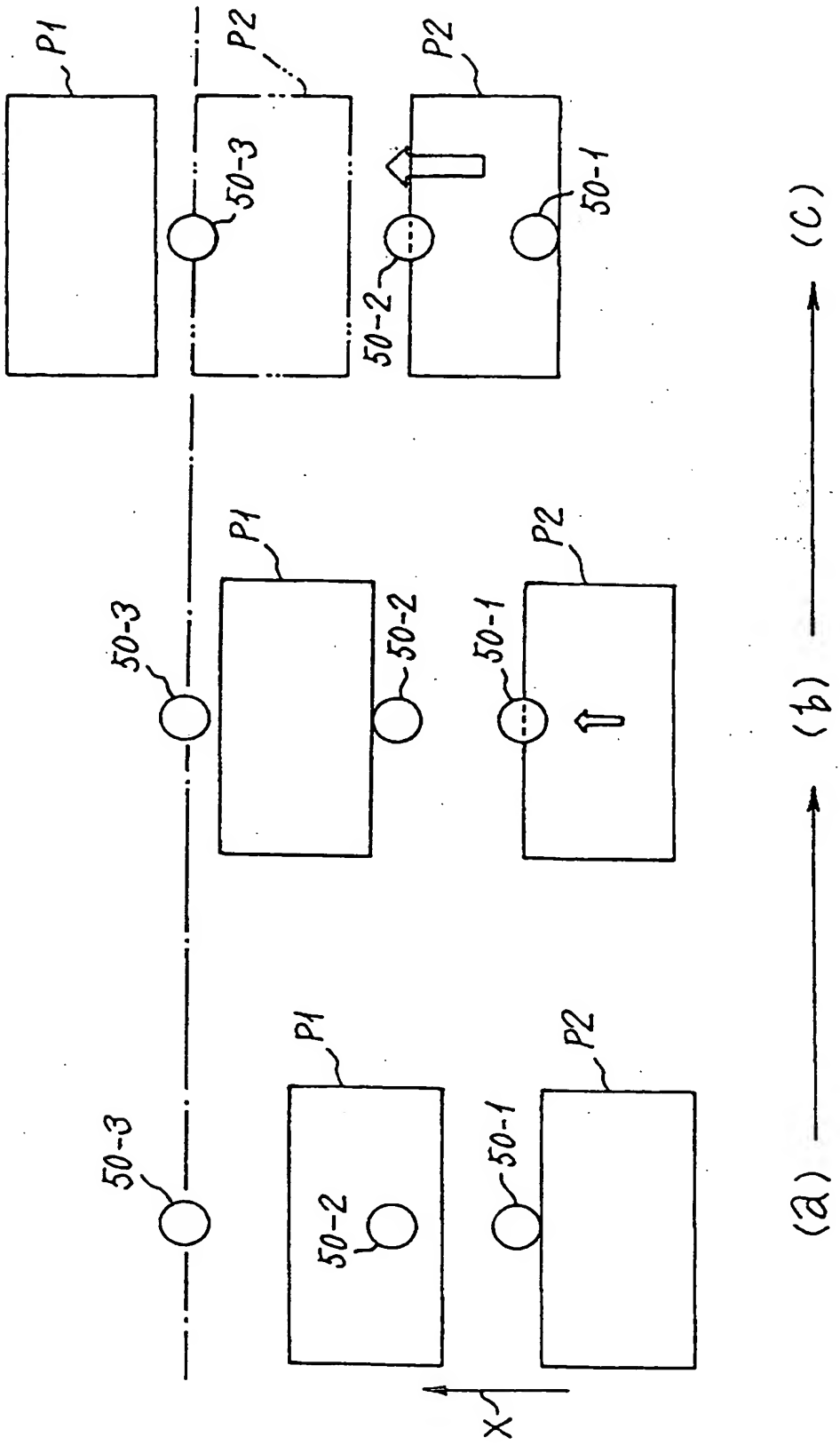


FIG. 14

FIG. 15

PRINTING SPEED	PAPER LENGTH (FIRST TO EIGHT SENSORS)	PAPER SIZE	INITIAL POSITION OF PAPER TRAILING EDGE : BETWEEN SENSORS	MEASUREMENT OF TIME BETWEEN SENSORS IN SPEED MEASURING ZONE	2ND SHEET INTAKE SENSOR (TRANSPORT TYPE)
16rpm 30rpm	LONG SIZE	DLY, A3Y	0−1	1−2	1ST SENSOR
		B4Y, LEGAL Y	1−2	2−3	2ND SENSOR
	SHORT SIZE	A4Y, B5Y,	2−3	3−5	3RD SENSOR
		A4T, LETTER T	3−4	4−6	4TH SENSOR
		B5T	4−5	5−7	6TH SENSOR
OTHER SPEED	LONG SIZE	DLY, A3Y	0−1	1−2	1ST SENSOR
		B4Y, LEGAL Y	1−2	2−3	2ND SENSOR
	SHORT SIZE	A4Y, B5Y, LETTER Y	2−3	3−5	3RD SENSOR
		A4T, LETTER T	3−4	4−6	4TH SENSOR
		B5T	4−5	5−7	6TH SENSOR

FIG. 16

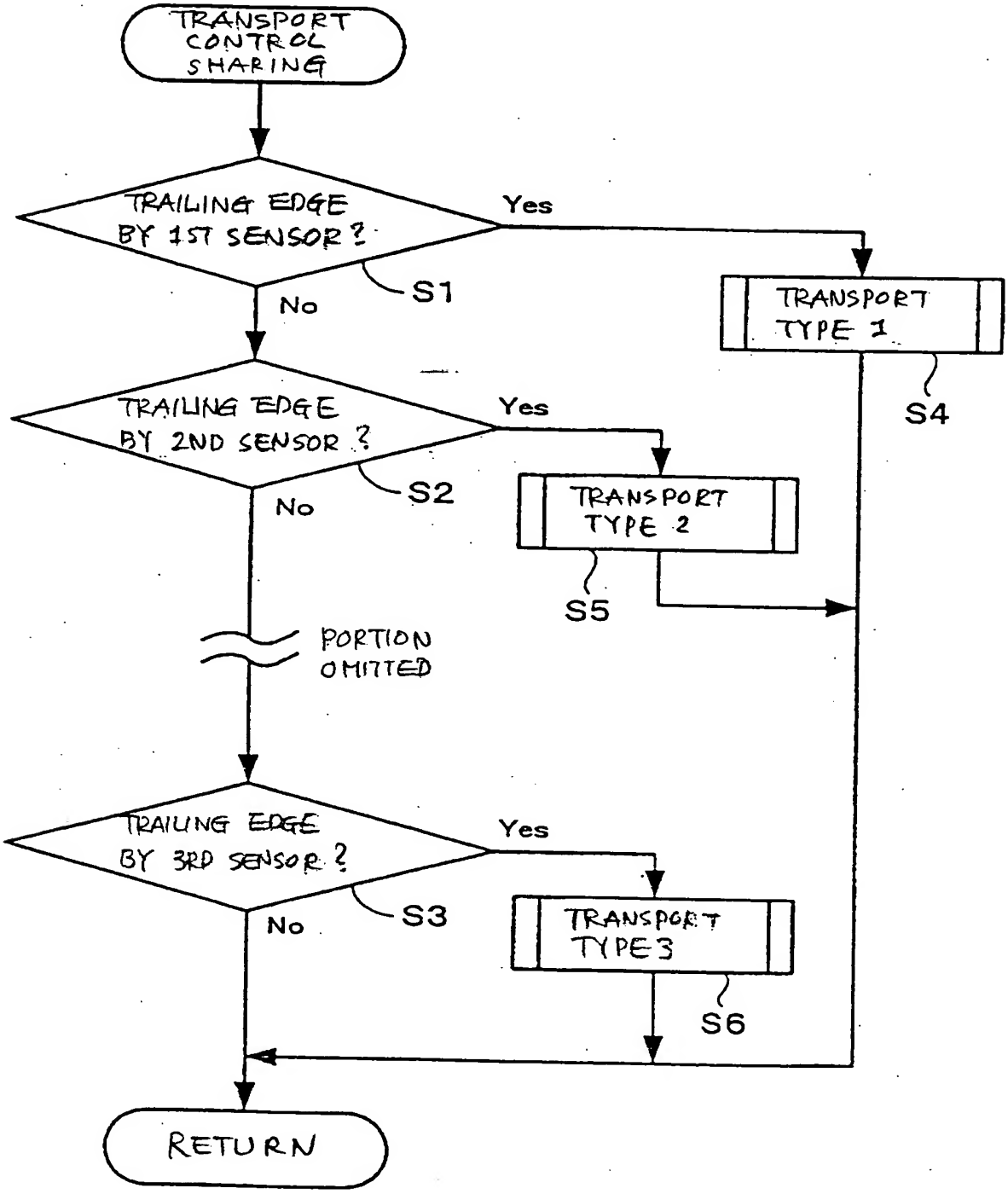

TRANSPORT CONTROL SHARING
TRAILING EDGE BY 1ST SENSOR ?
Yes
No
S1
TRANSPORT TYPE 1
S4
TRAILING EDGE BY 2ND SENSOR ?
Yes
No
S2
TRANSPORT TYPE 2
S5
PORTION OMITTED
TRAILING EDGE BY 3RD SENSOR ?
Yes
No
S3
TRANSPORT TYPE3
S6
RETURN

FIG. 17

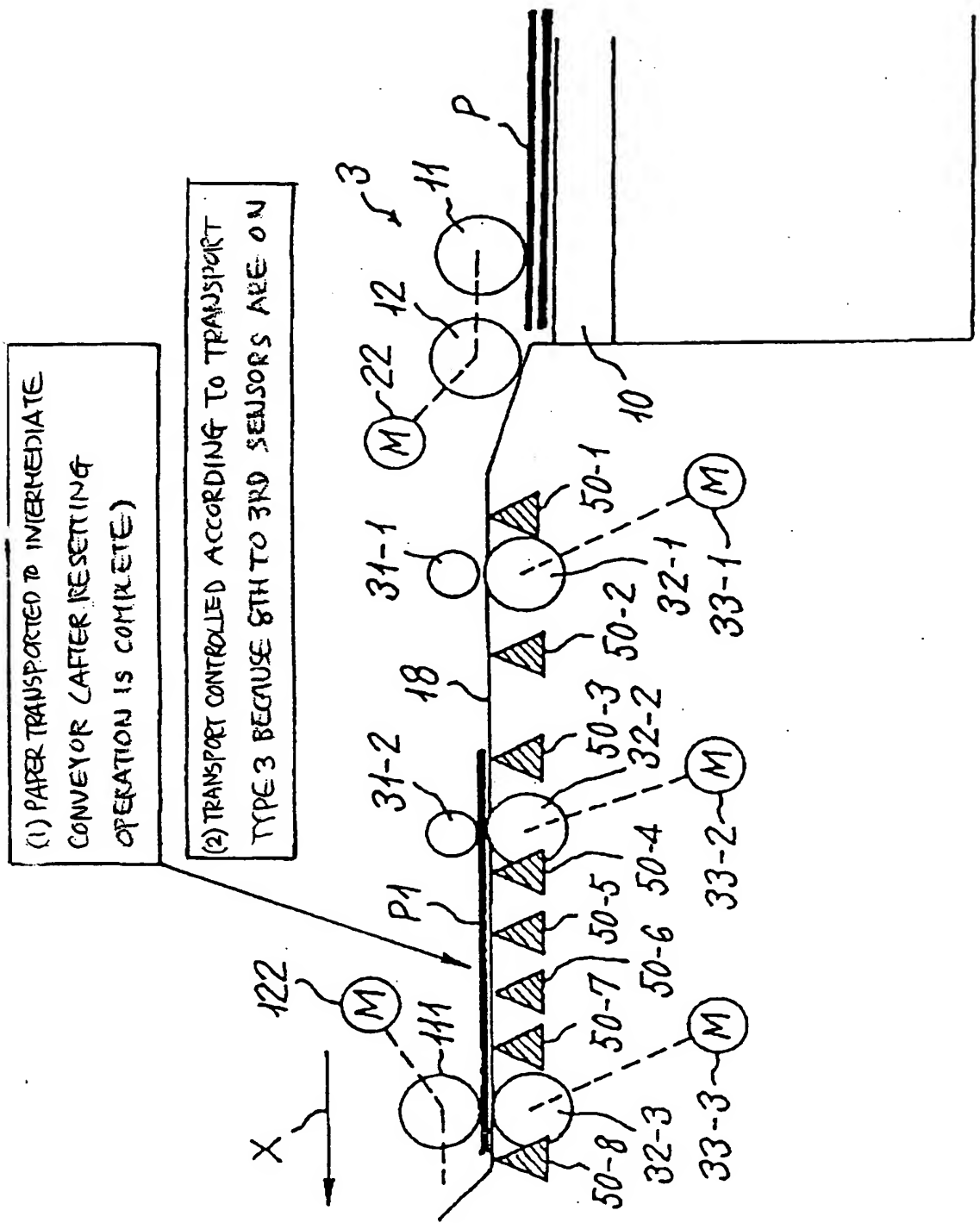

(1) PAPER TRANSPORTED TO INTERMEDIATE CONVEYOR (AFTER RESETTING OPERATION IS COMPLETED)
(2) TRANSPORT CONTROLLED ACCORDING TO TRANSPORT TYPE 3 BECAUSE 8TH TO 3RD SENSORS ARE ON
X
122
111
P1
18
31-1
31-2
22
12
11
3
P
10
50-1
50-2
50-3
50-4
50-5
50-6
50-7
50-8
32-1
32-2
32-3
33-1
33-2
33-3
M

FIG. 18A

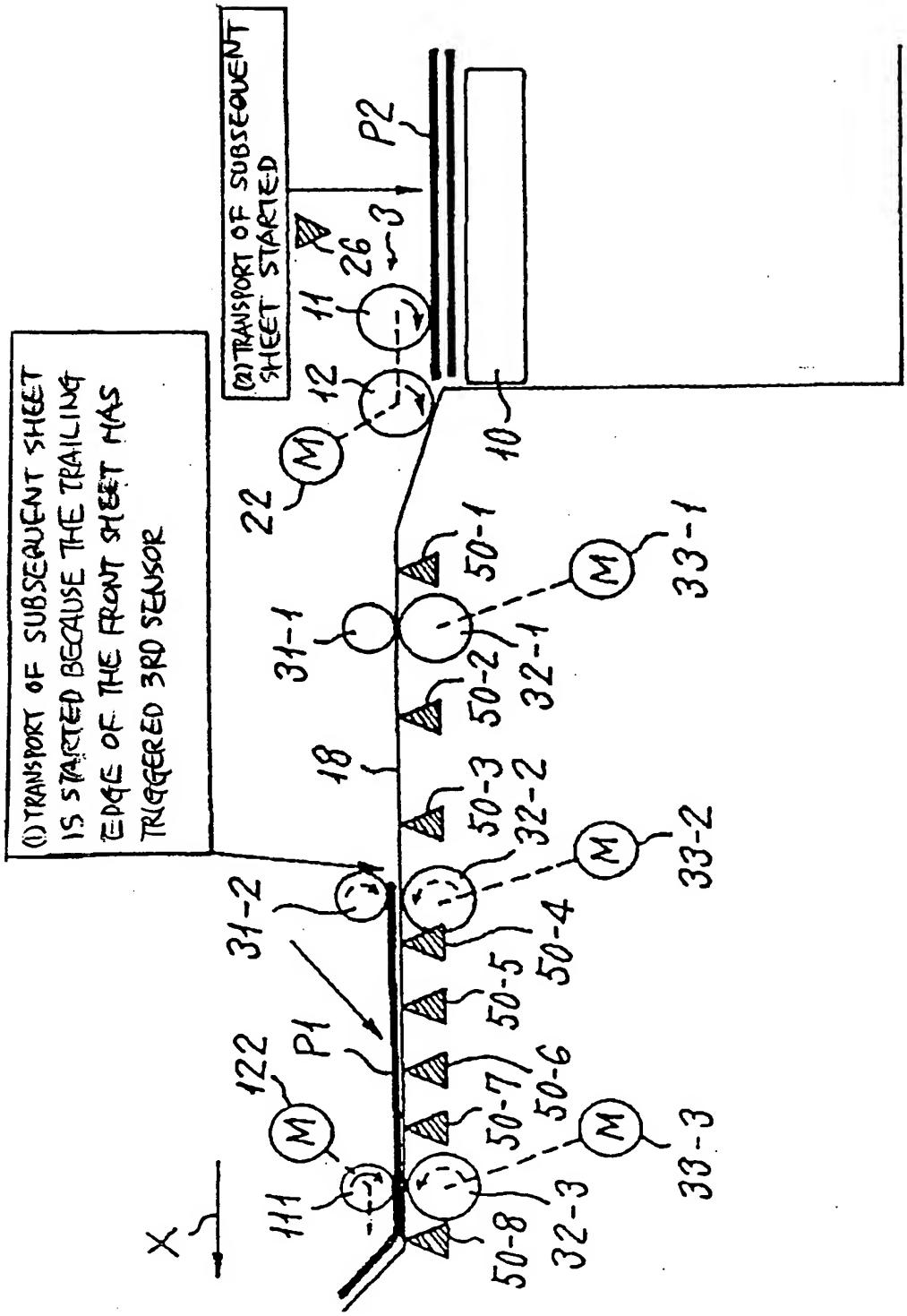

(1) TRANSPORT OF SUBSEQUENT SHEET IS STARTED BECAUSE THE TRAILING EDGE OF THE FRONT SHEET HAS TRIGGERED 3RD SENSOR
(2) TRANSPORT OF SUBSEQUENT SHEET STARTED
X
111
122
P1
P2
10
11
12
18
22
26
31-1
31-2
32-1
32-2
32-3
33-1
33-2
33-3
50-1
50-2
50-3
50-4
50-5
50-6
50-7
50-8
M

FIG. 18B

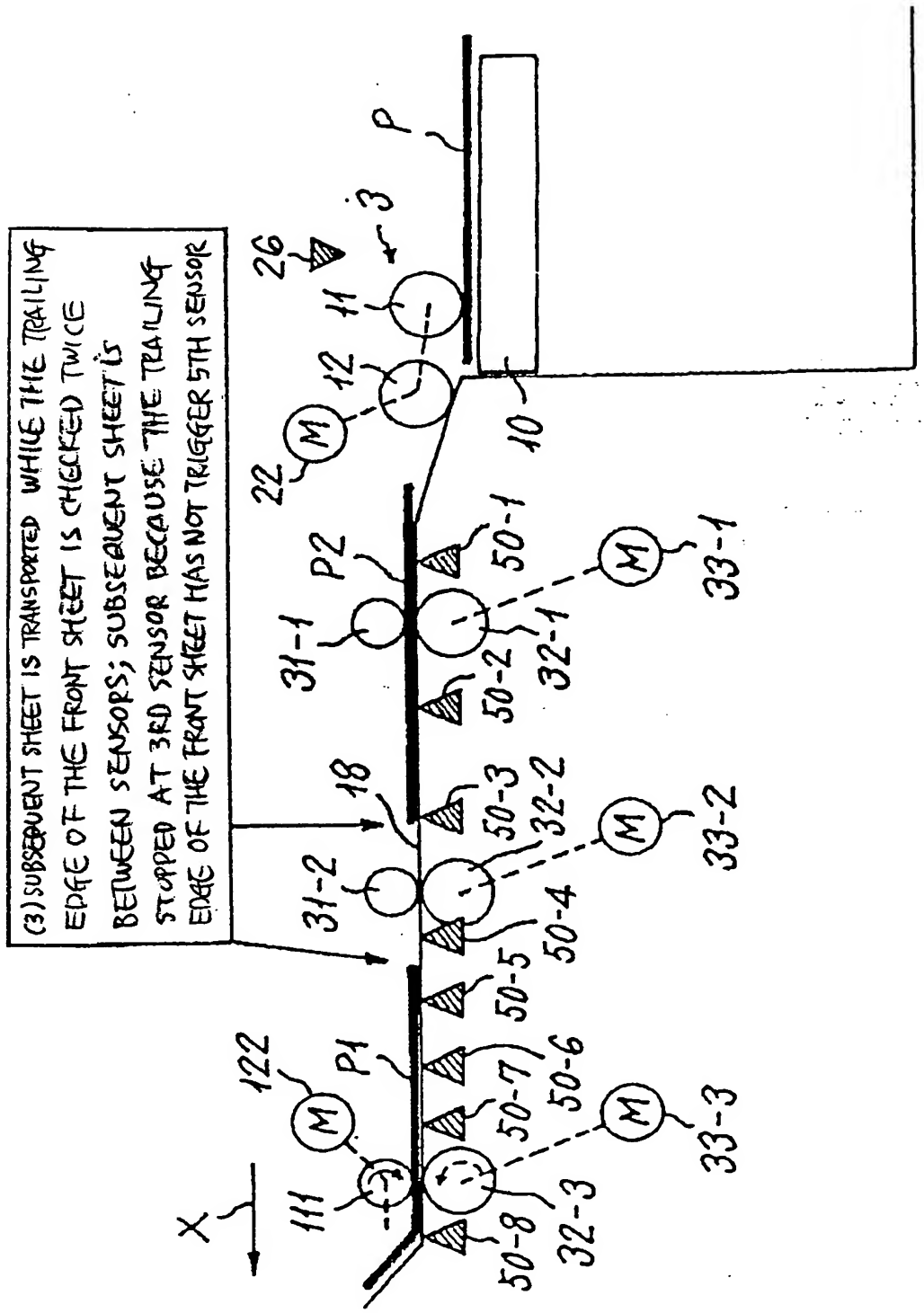

(3) SUBSEQUENT SHEET IS TRANSPORTED WHILE THE TRAILING EDGE OF THE FRONT SHEET IS CHECKED TWICE BETWEEN SENSORS; SUBSEQUENT SHEET IS STOPPED AT 3RD SENSOR BECAUSE THE TRAILING EDGE OF THE FRONT SHEET HAS NOT TRIGGER 5TH SENSOR
X
111
122
P1
P2
P
31-1
31-2
32-1
32-2
32-3
33-1
33-2
33-3
50-1
50-2
50-3
50-4
50-5
50-6
50-7
50-8
10
11
12
18
22
26
3
M

FIG. 19A

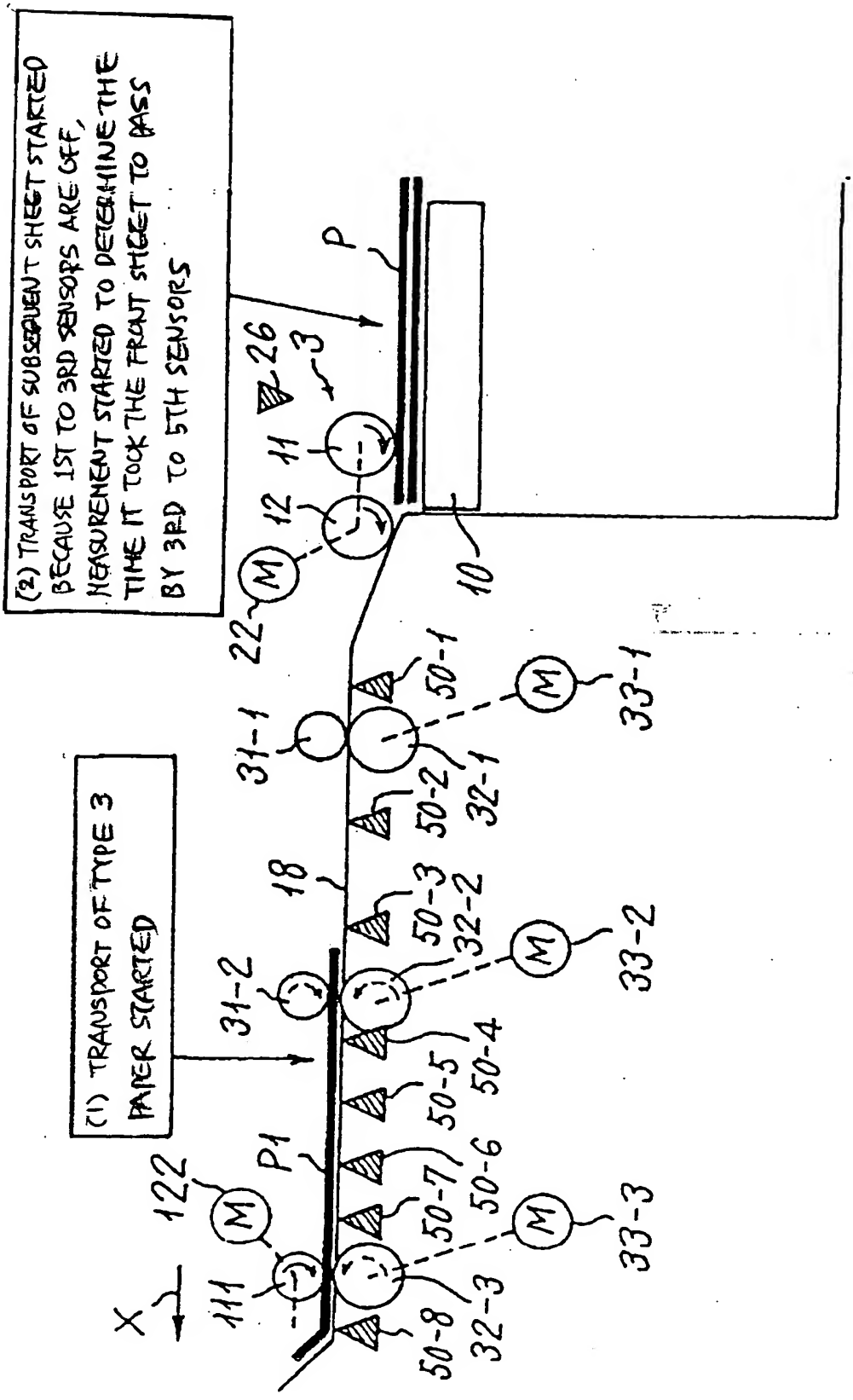

(2) TRANSPORT OF SUBSEQUENT SHEET STARTED BECAUSE 1ST TO 3RD SENSORS ARE OFF, MEASUREMENT STARTED TO DETERMINE THE TIME IT TOOK THE FRONT SHEET TO PASS BY 3RD TO 5TH SENSORS
(1) TRANSPORT OF TYPE 3 PAPER STARTED
X
P
P1
10
11
12
18
22
26
3
111
122
31-1
31-2
32-1
32-2
32-3
33-1
33-2
33-3
50-1
50-2
50-3
50-4
50-5
50-6
50-7
50-8
M

FIG. 19B

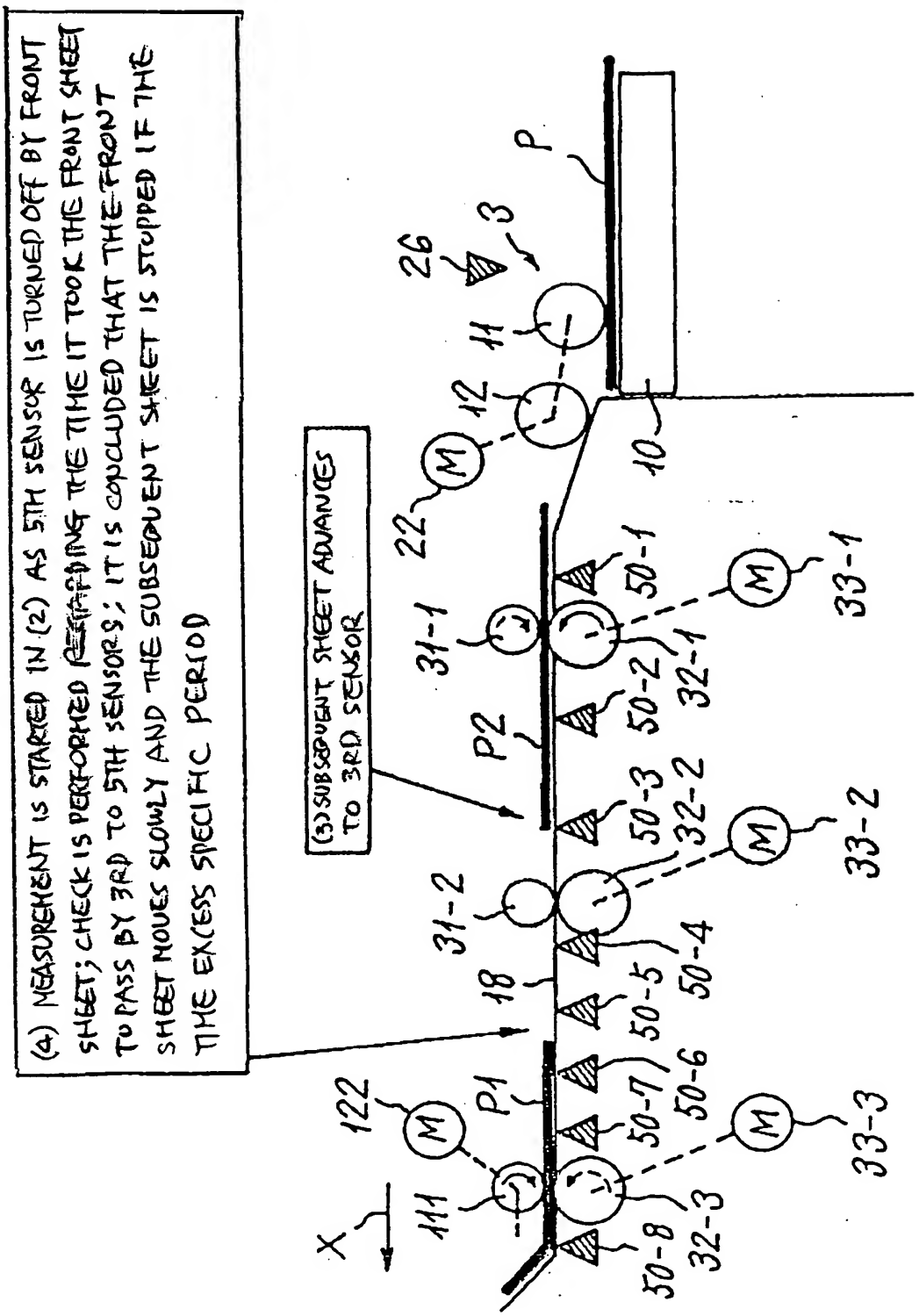

(4) MEASUREMENT IS STARTED IN (2) AS 5TH SENSOR IS TURNED OFF BY FRONT SHEET; CHECK IS PERFORMED REGARDING THE TIME IT TOOK THE FRONT SHEET TO PASS BY 3RD TO 5TH SENSORS; IT IS CONCLUDED THAT THE FRONT SHEET MOVES SLOWLY AND THE SUBSEQUENT SHEET IS STOPPED IF THE TIME EXCESS SPECIFIC PERIOD
(3) SUBSEQUENT SHEET ADVANCES TO 3RD SENSOR
X
111
122
M
P1
18
31-2
P2
31-1
22
M
12
11
26
3
P
10
50-1
50-2
50-3
50-4
50-5
50-6
50-7
50-8
32-1
32-2
32-3
M
33-1
33-2
33-3

FIG. 20

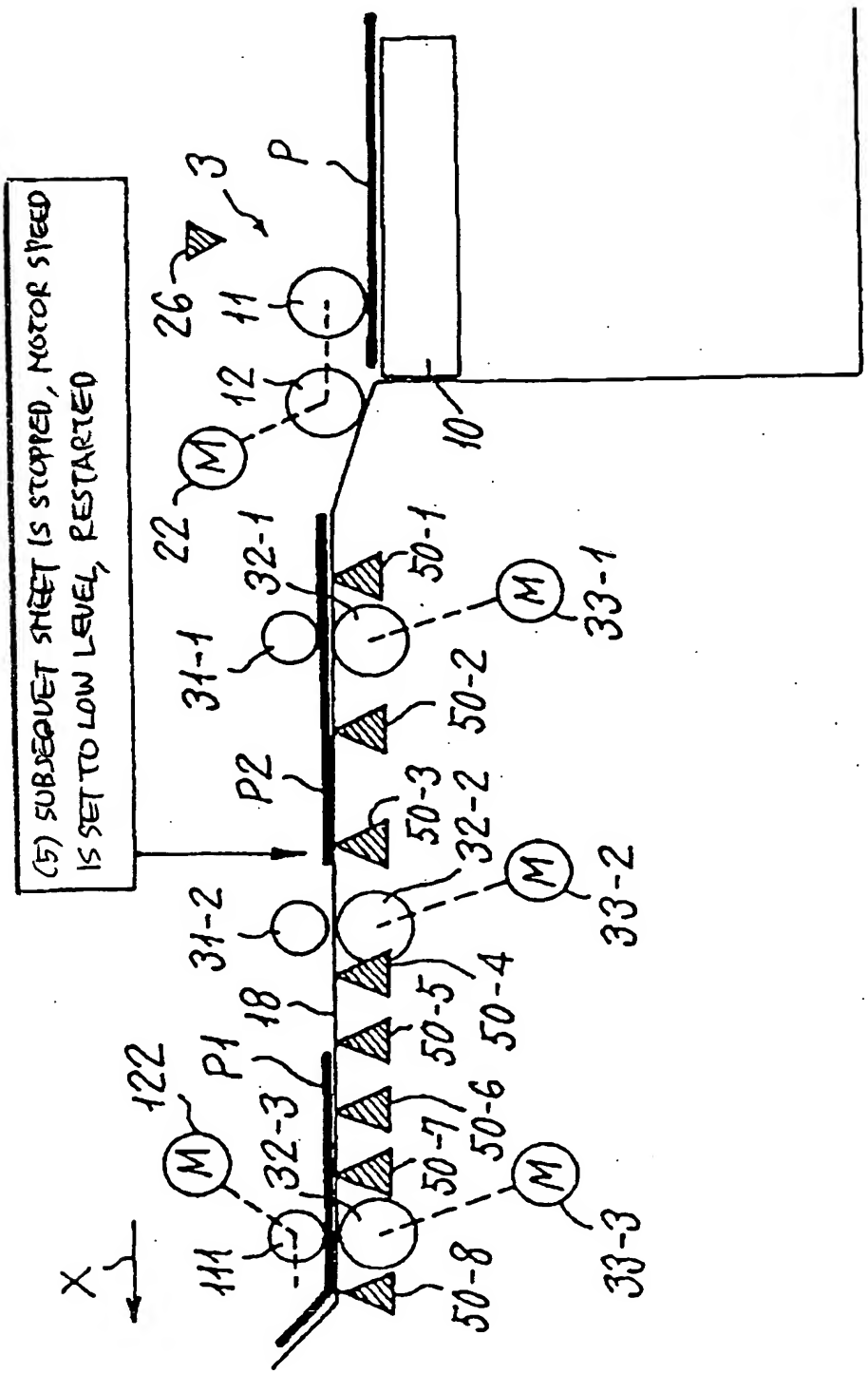

(5) SUBSEQUET SHEET IS STOPPED, MOTOR SPEED IS SET TO LOW LEVEL, RESTARTED
X
111
122
P1
P2
P
3
26
11
12
10
22
18
31-1
31-2
32-1
32-2
32-3
33-1
33-2
33-3
50-1
50-2
50-3
50-4
50-5
50-6
50-7
50-8
M

FIG. 21

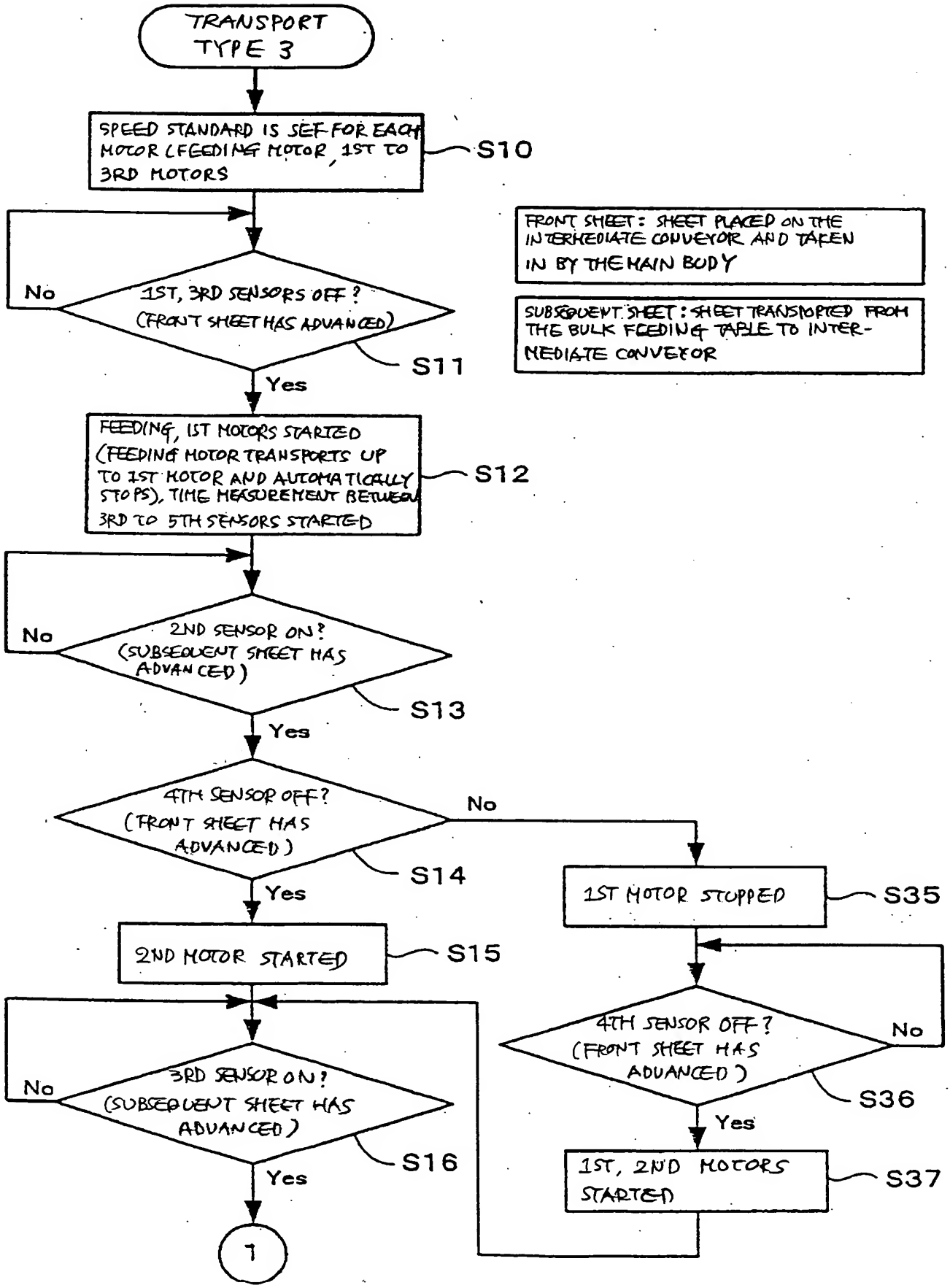

TRANSPORT TYPE 3
SPEED STANDARD IS SET FOR EACH MOTOR (FEEDING MOTOR, 1ST TO 3RD MOTORS
S10
FRONT SHEET: SHEET PLACED ON THE INTERMEDIATE CONVEYOR AND TAKEN IN BY THE MAIN BODY
SUBSEQUENT SHEET: SHEET TRANSPORTED FROM THE BULK FEEDING TABLE TO INTERMEDIATE CONVEYOR
No
1ST, 3RD SENSORS OFF? (FRONT SHEET HAS ADVANCED)
S11
Yes
FEEDING, 1ST MOTORS STARTED (FEEDING MOTOR TRANSPORTS UP TO 1ST MOTOR AND AUTOMATICALLY STOPS), TIME MEASUREMENT BETWEEN 3RD TO 5TH SENSORS STARTED
S12
No
2ND SENSOR ON? (SUBSEQUENT SHEET HAS ADVANCED)
S13
Yes
4TH SENSOR OFF? (FRONT SHEET HAS ADVANCED)
No
S14
Yes
2ND MOTOR STARTED
S15
No
3RD SENSOR ON? (SUBSEQUENT SHEET HAS ADVANCED)
S16
Yes
1
1ST MOTOR STOPPED
S35
4TH SENSOR OFF? (FRONT SHEET HAS ADVANCED)
No
S36
Yes
1ST, 2ND MOTORS STARTED
S37

FIG. 22

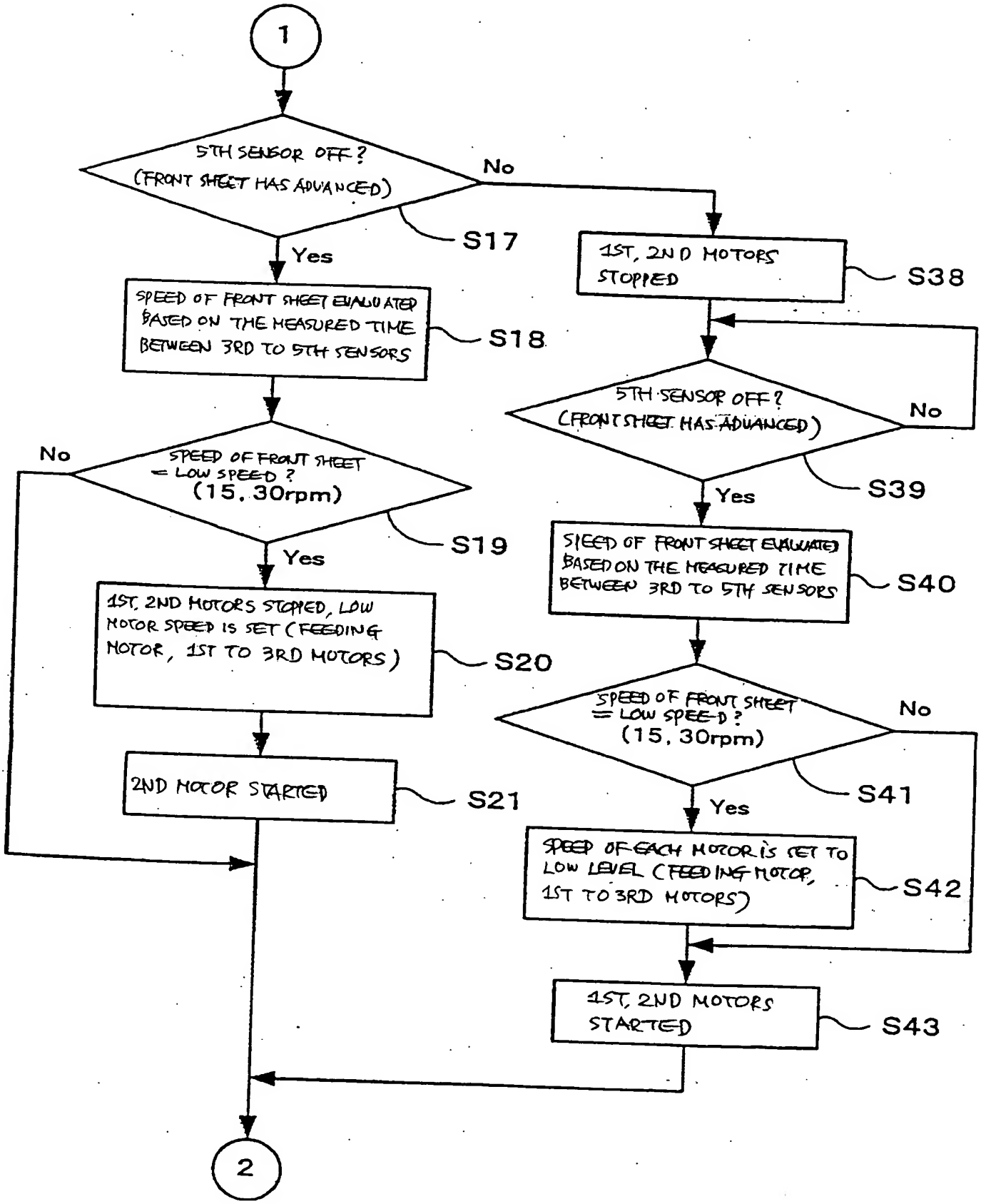

1
5TH SENSOR OFF? (FRONT SHEET HAS ADVANCED)
No
S17
Yes
SPEED OF FRONT SHEET EVALUATED BASED ON THE MEASURED TIME BETWEEN 3RD TO 5TH SENSORS
S18
No
SPEED OF FRONT SHEET = LOW SPEED ? (15, 30rpm)
S19
Yes
1ST, 2ND MOTORS STOPPED, LOW MOTOR SPEED IS SET (FEEDING MOTOR, 1ST TO 3RD MOTORS)
S20
2ND MOTOR STARTED
S21
1ST, 2ND MOTORS STOPPED
S38
5TH SENSOR OFF? (FRONT SHEET HAS ADVANCED)
No
S39
Yes
SPEED OF FRONT SHEET EVALUATED BASED ON THE MEASURED TIME BETWEEN 3RD TO 5TH SENSORS
S40
SPEED OF FRONT SHEET = LOW SPEED ? (15, 30rpm)
No
S41
Yes
SPEED OF EACH MOTOR IS SET TO LOW LEVEL (FEEDING MOTOR, 1ST TO 3RD MOTORS)
S42
1ST, 2ND MOTORS STARTED
S43
2

FIG. 23

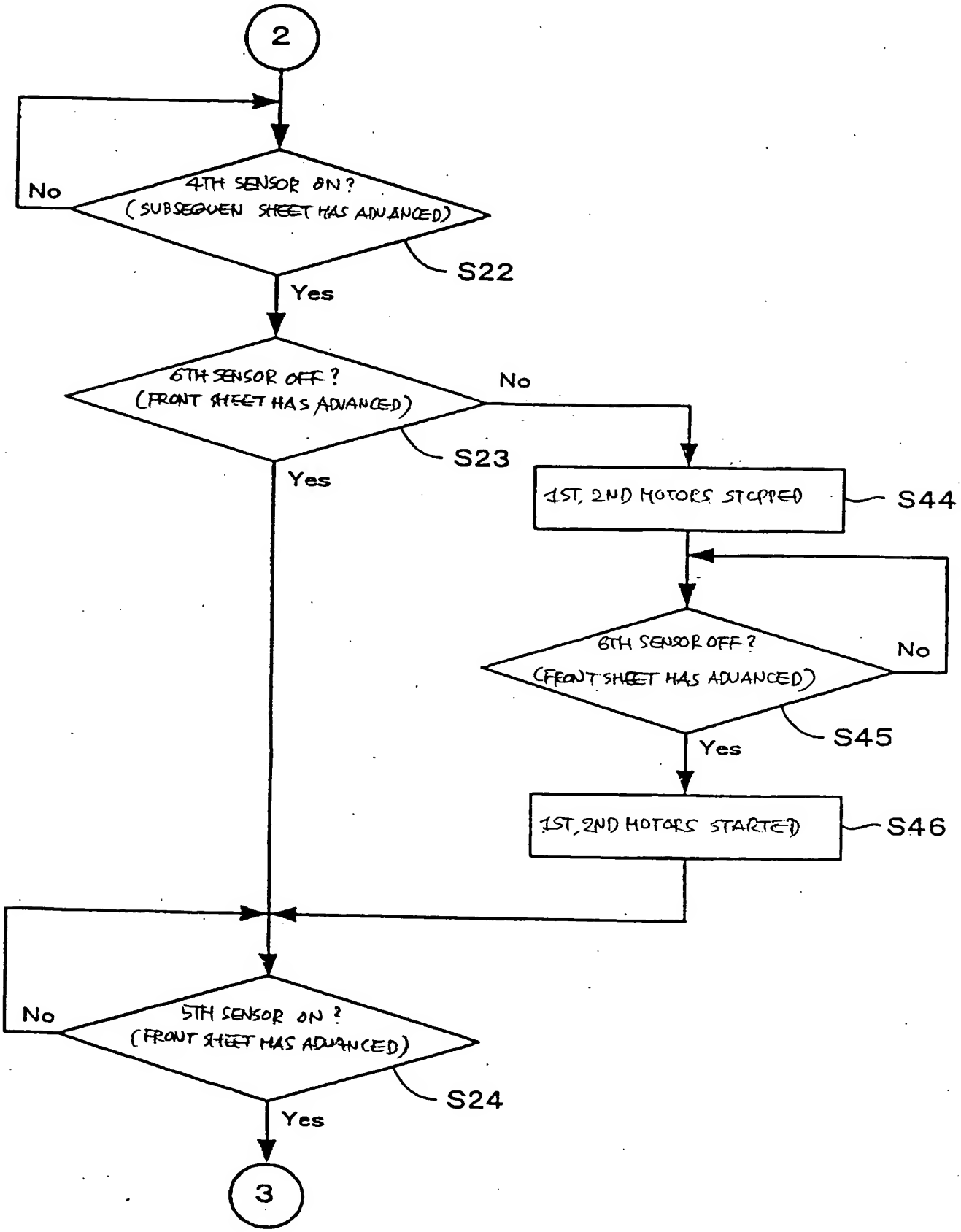

2
4TH SENSOR ON?
(SUBSEQUEN SHEET HAS ADVANCED)
No
S22
Yes
6TH SENSOR OFF?
(FRONT SHEET HAS ADVANCED)
No
S23
Yes
1ST, 2ND MOTORS STOPPED
S44
6TH SENSOR OFF?
(FRONT SHEET HAS ADVANCED)
No
S45
Yes
1ST, 2ND MOTORS STARTED
S46
5TH SENSOR ON?
(FRONT SHEET HAS ADVANCED)
No
S24
Yes
3

FIG. 24

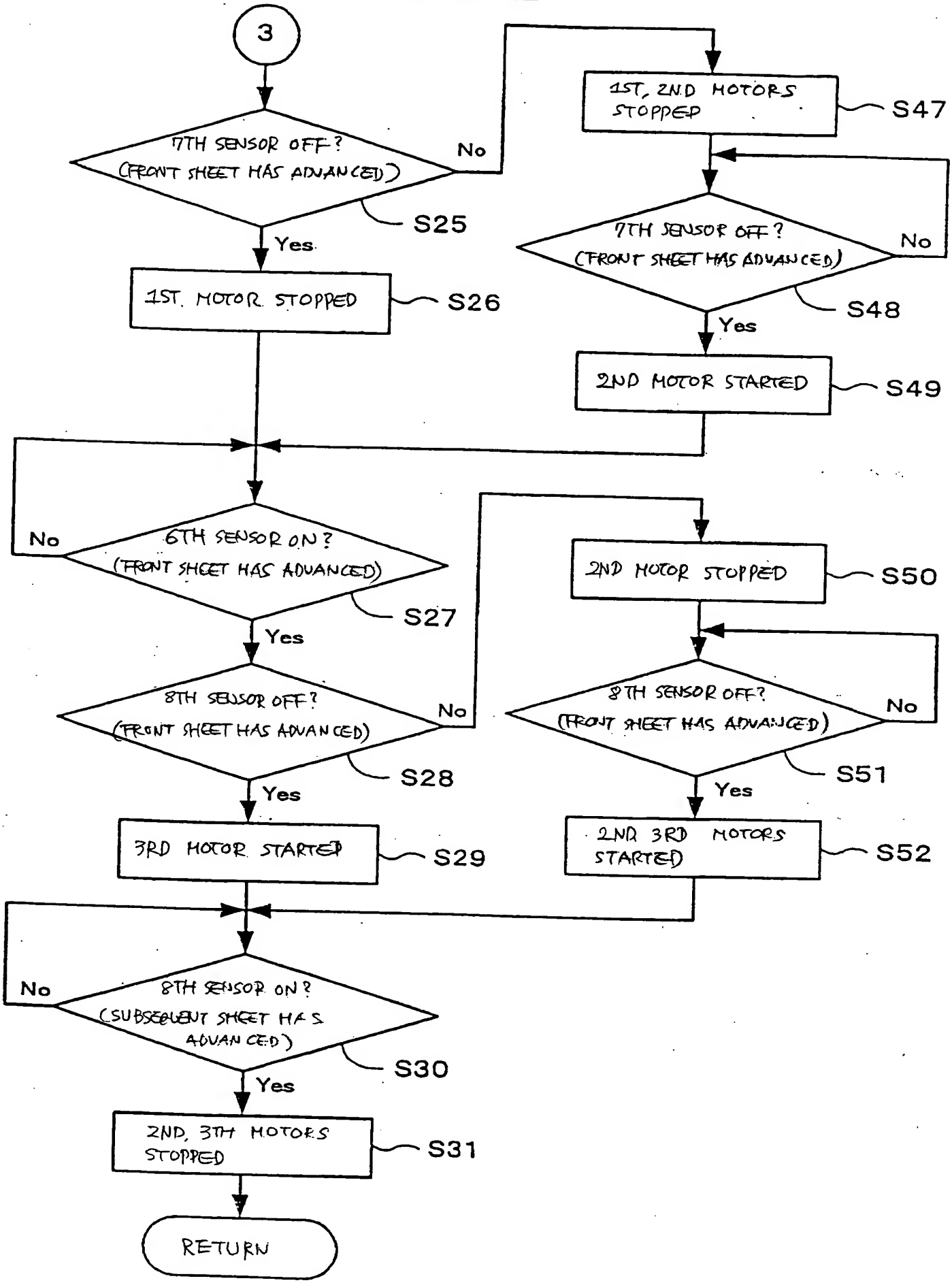

3
7TH SENSOR OFF? (FRONT SHEET HAS ADVANCED)
No
Yes
S25
1ST, 2ND MOTORS STOPPED
S47
7TH SENSOR OFF? (FRONT SHEET HAS ADVANCED)
No
Yes
S48
1ST MOTOR STOPPED
S26
2ND MOTOR STARTED
S49
6TH SENSOR ON? (FRONT SHEET HAS ADVANCED)
No
Yes
S27
2ND MOTOR STOPPED
S50
8TH SENSOR OFF? (FRONT SHEET HAS ADVANCED)
No
Yes
S28
8TH SENSOR OFF? (FRONT SHEET HAS ADVANCED)
No
Yes
S51
3RD MOTOR STARTED
S29
2ND 3RD MOTORS STARTED
S52
8TH SENSOR ON? (SUBSEQUENT SHEET HAS ADVANCED)
No
Yes
S30
2ND, 3TH MOTORS STOPPED
S31
RETURN

FIG. 25

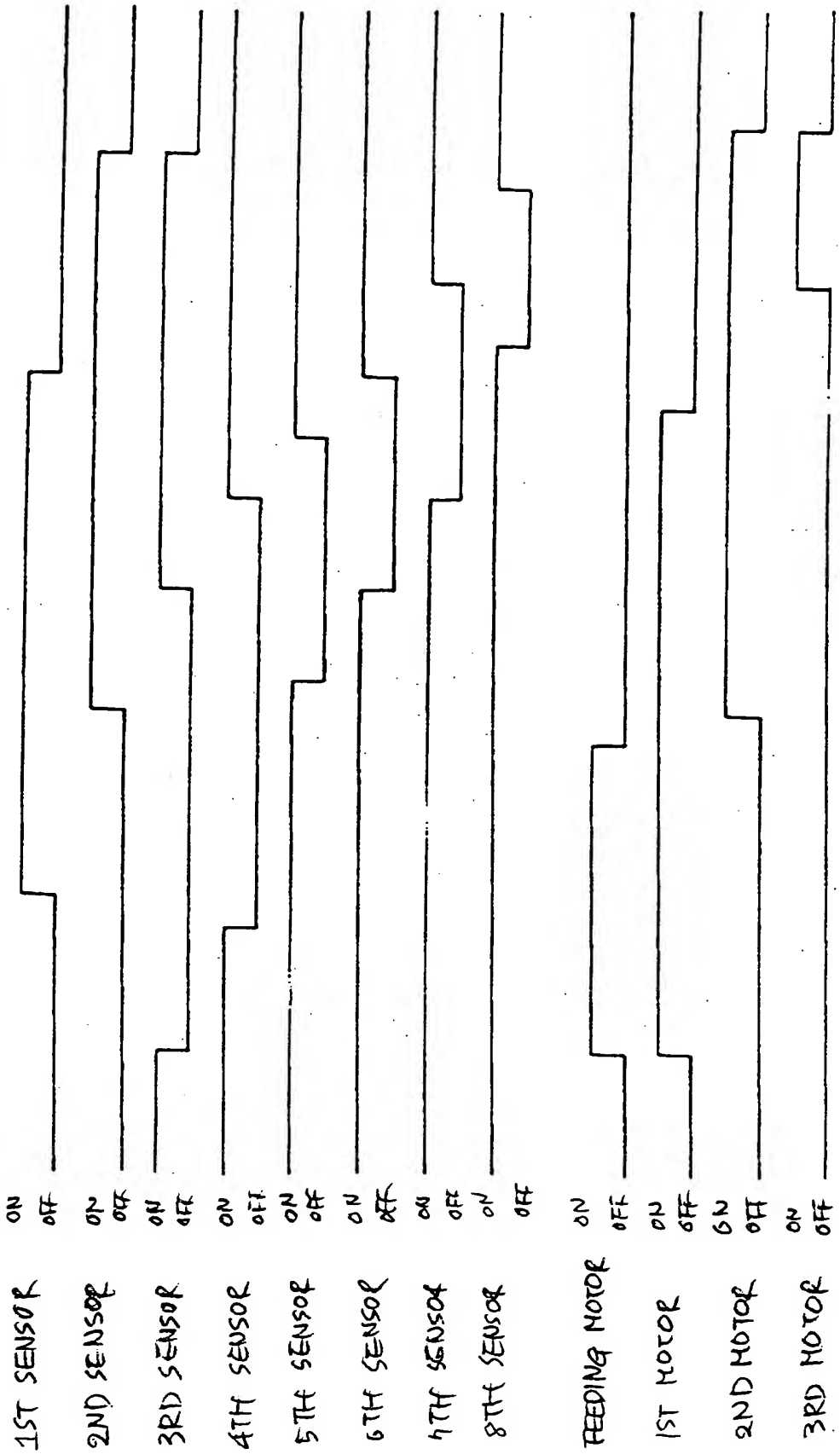

1ST SENSOR
2ND SENSOR
3RD SENSOR
4TH SENSOR
5TH SENSOR
6TH SENSOR
7TH SENSOR
8TH SENSOR
FEEDING MOTOR
1ST MOTOR
2ND MOTOR
3RD MOTOR
ON
OFF

FIG. 26A

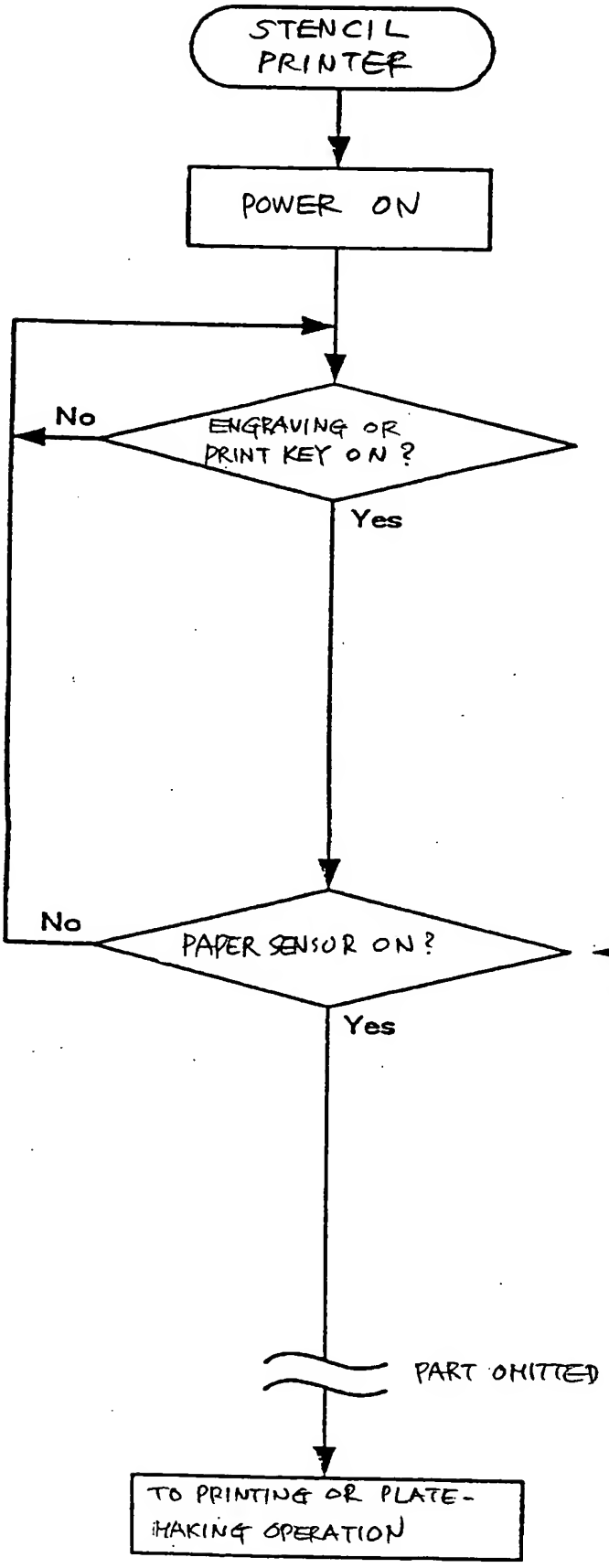


FIG. 26B

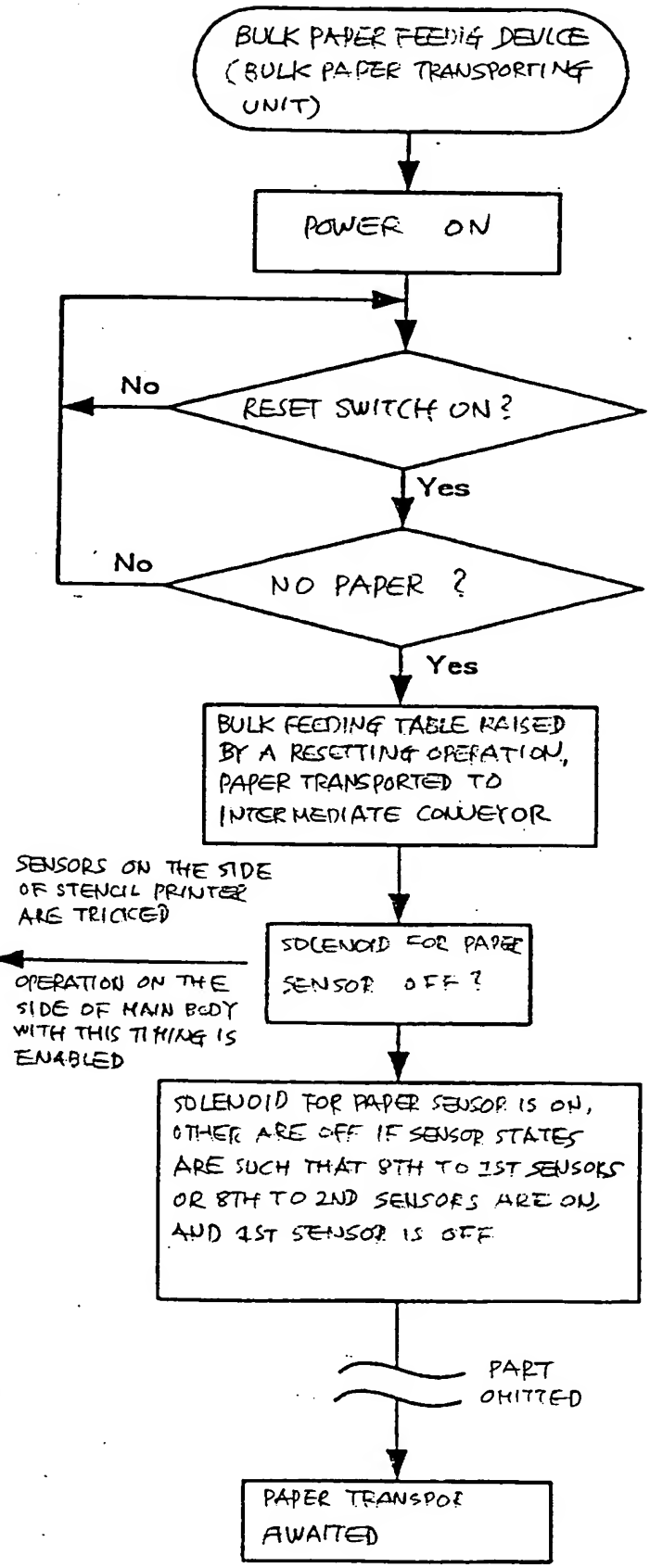


FIG. 27

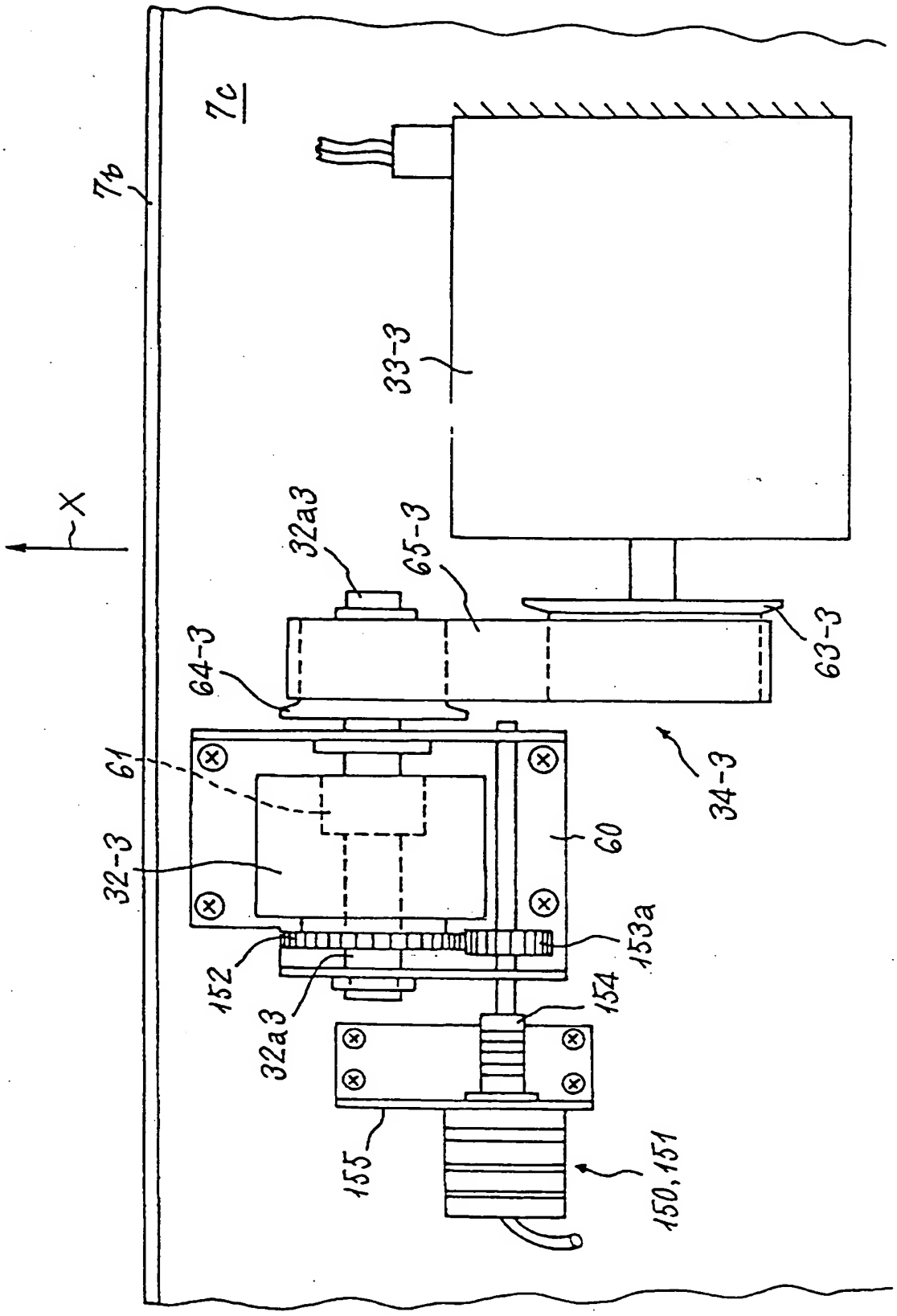

7c
7b
X
33-3
32a3
65-3
63-3
64-3
61
34-3
32-3
60
153a
152
154
32a3
155
150,151

FIG. 28A

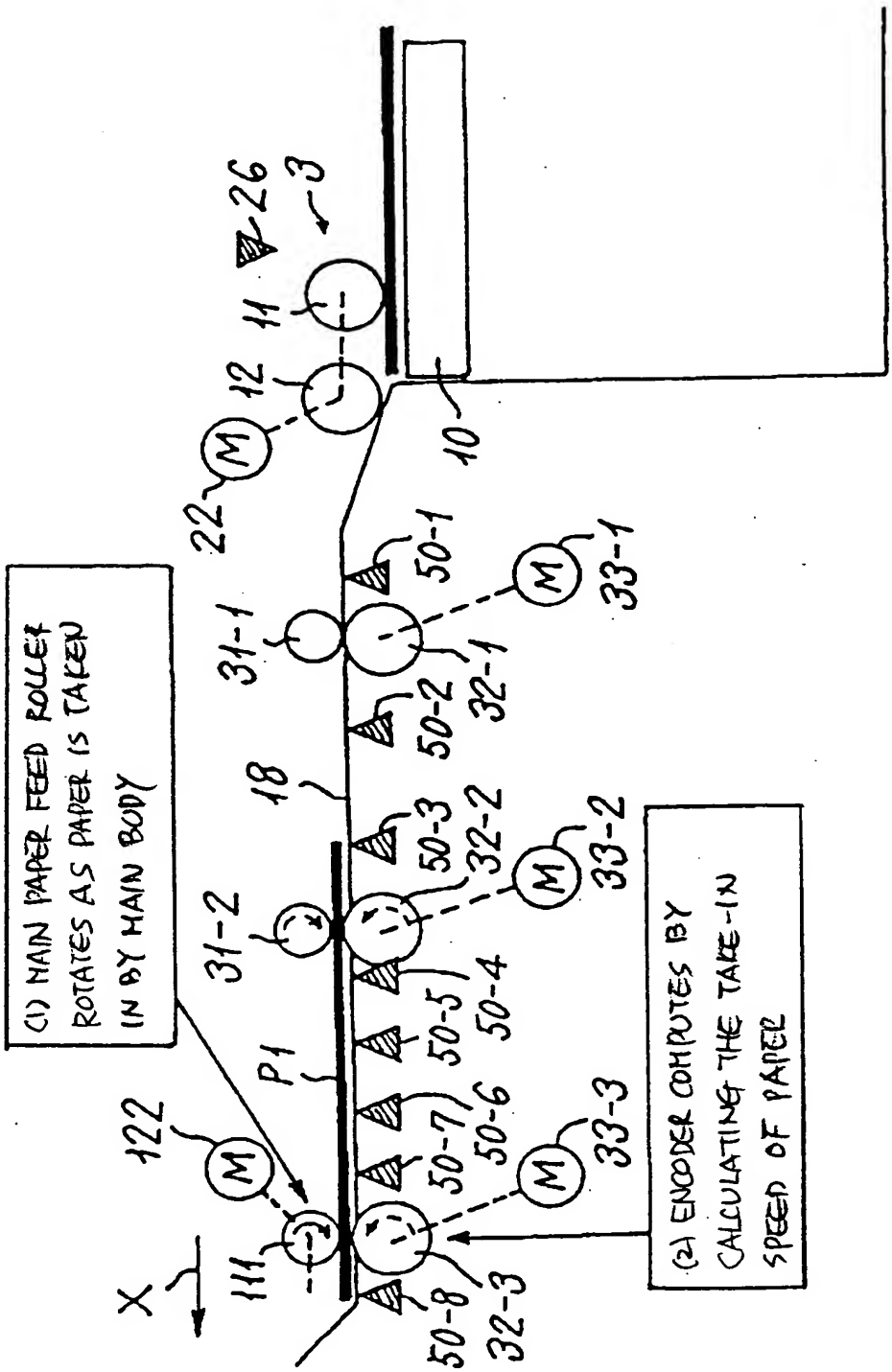

(1) MAIN PAPER FEED ROLLER ROTATES AS PAPER IS TAKEN IN BY MAIN BODY
(2) ENCODER COMPUTES BY CALCULATING THE TAKE-IN SPEED OF PAPER
X
111
122
P1
18
10
11
12
22
26
3
31-1
31-2
32-1
32-2
32-3
33-1
33-2
33-3
50-1
50-2
50-3
50-4
50-5
50-6
50-7
50-8
M

FIG. 28B

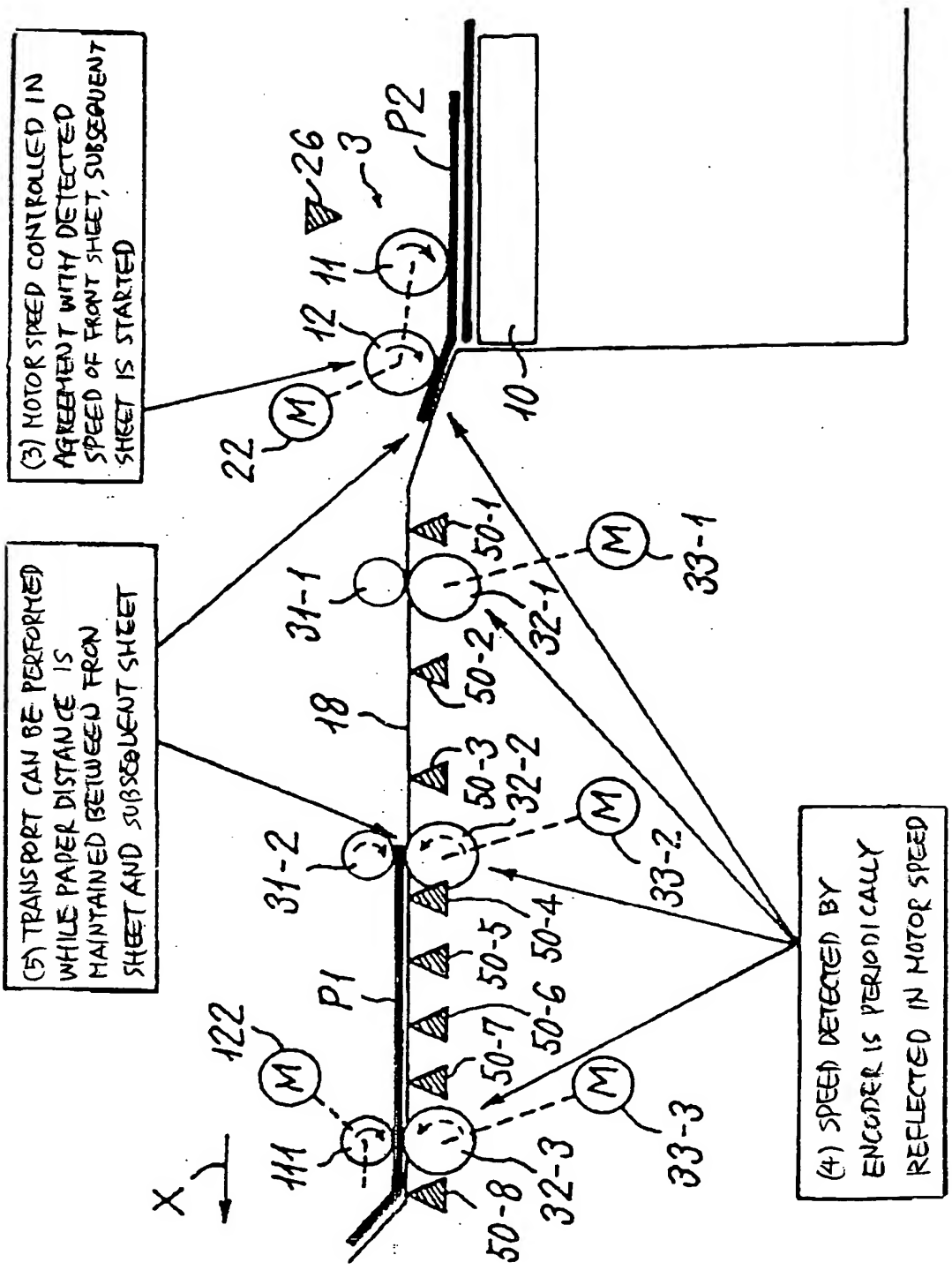

(3) MOTOR SPEED CONTROLLED IN AGREEMENT WITH DETECTED SPEED OF FRONT SHEET, SUBSEQUENT SHEET IS STARTED
(5) TRANSPORT CAN BE PERFORMED WHILE PAPER DISTANCE IS MAINTAINED BETWEEN FRONT SHEET AND SUBSEQUENT SHEET
(4) SPEED DETECTED BY ENCODER IS PERIODICALLY REFLECTED IN MOTOR SPEED
X
P1
P2
10
11
12
18
22
26
3
111
122
31-1
31-2
32-1
32-2
32-3
33-1
33-2
33-3
50-1
50-2
50-3
50-4
50-5
50-6
50-7
50-8
M

FIG. 29

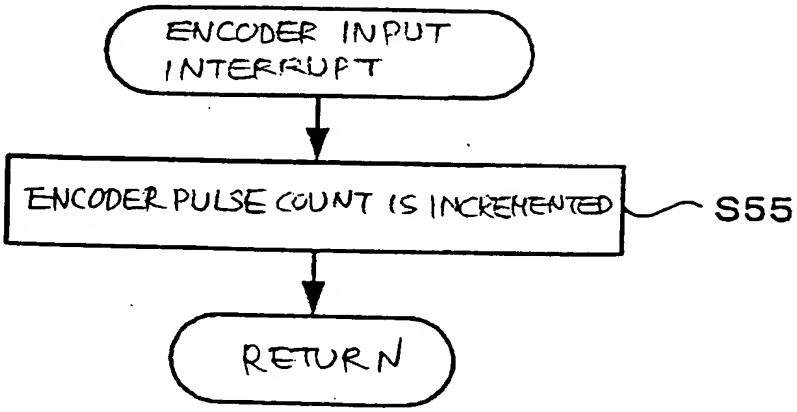

ENCODER INPUT INTERRUPT
ENCODER PULSE COUNT IS INCREMENTED
S55
RETURN

FIG. 30

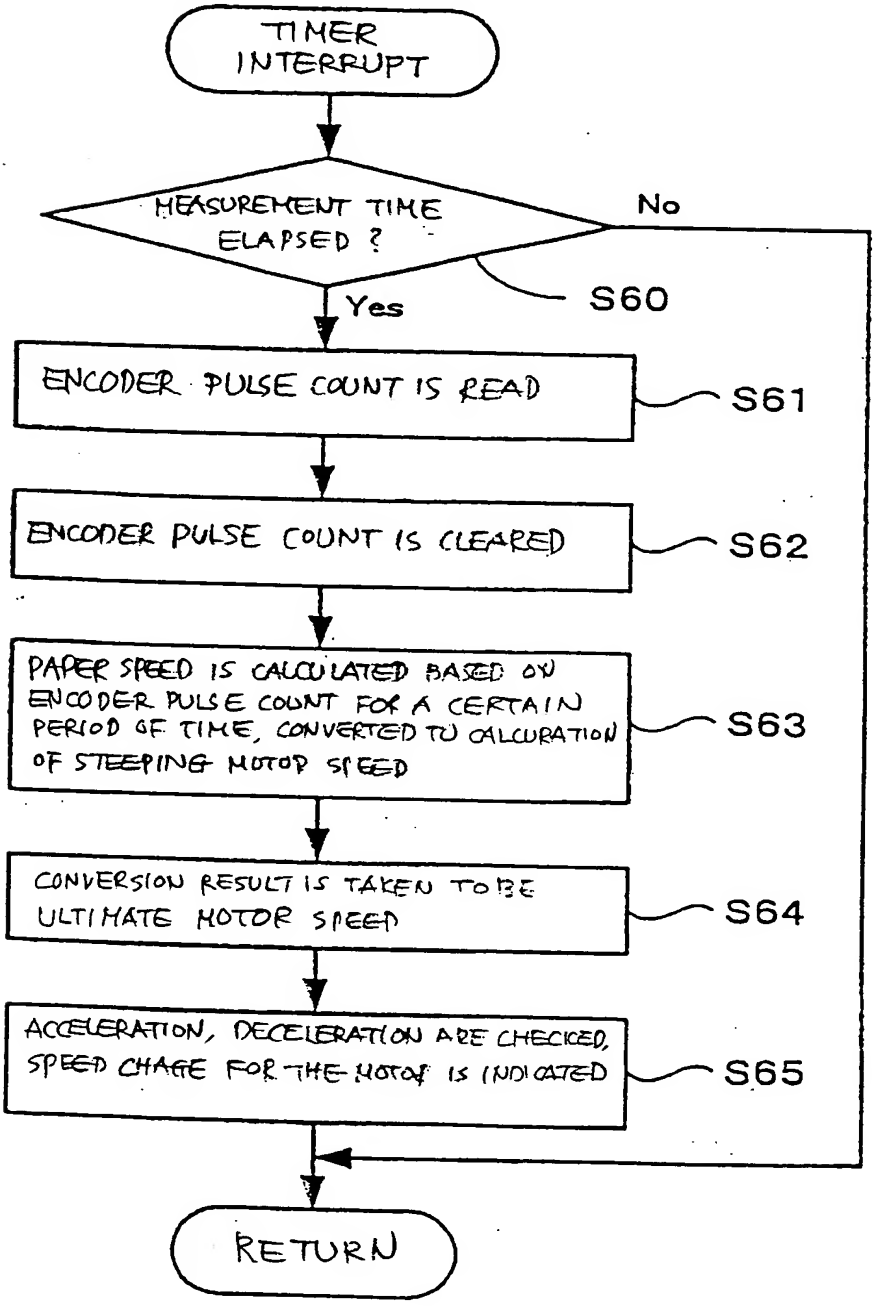

TIMER INTERRUPT
MEASUREMENT TIME ELAPSED ?
No
Yes
S60
ENCODER PULSE COUNT IS READ
S61
ENCODER PULSE COUNT IS CLEARED
S62
PAPER SPEED IS CALCULATED BASED ON ENCODER PULSE COUNT FOR A CERTAIN PERIOD OF TIME, CONVERTED TO CALCURATION OF STEEPING MOTOR SPEED
S63
CONVERSION RESULT IS TAKEN TO BE ULTIMATE MOTOR SPEED
S64
ACCELERATION, DECELERATION ARE CHECKED, SPEED CHAGE FOR THE MOTOR IS INDICATED
S65
RETURN

FIG. 31

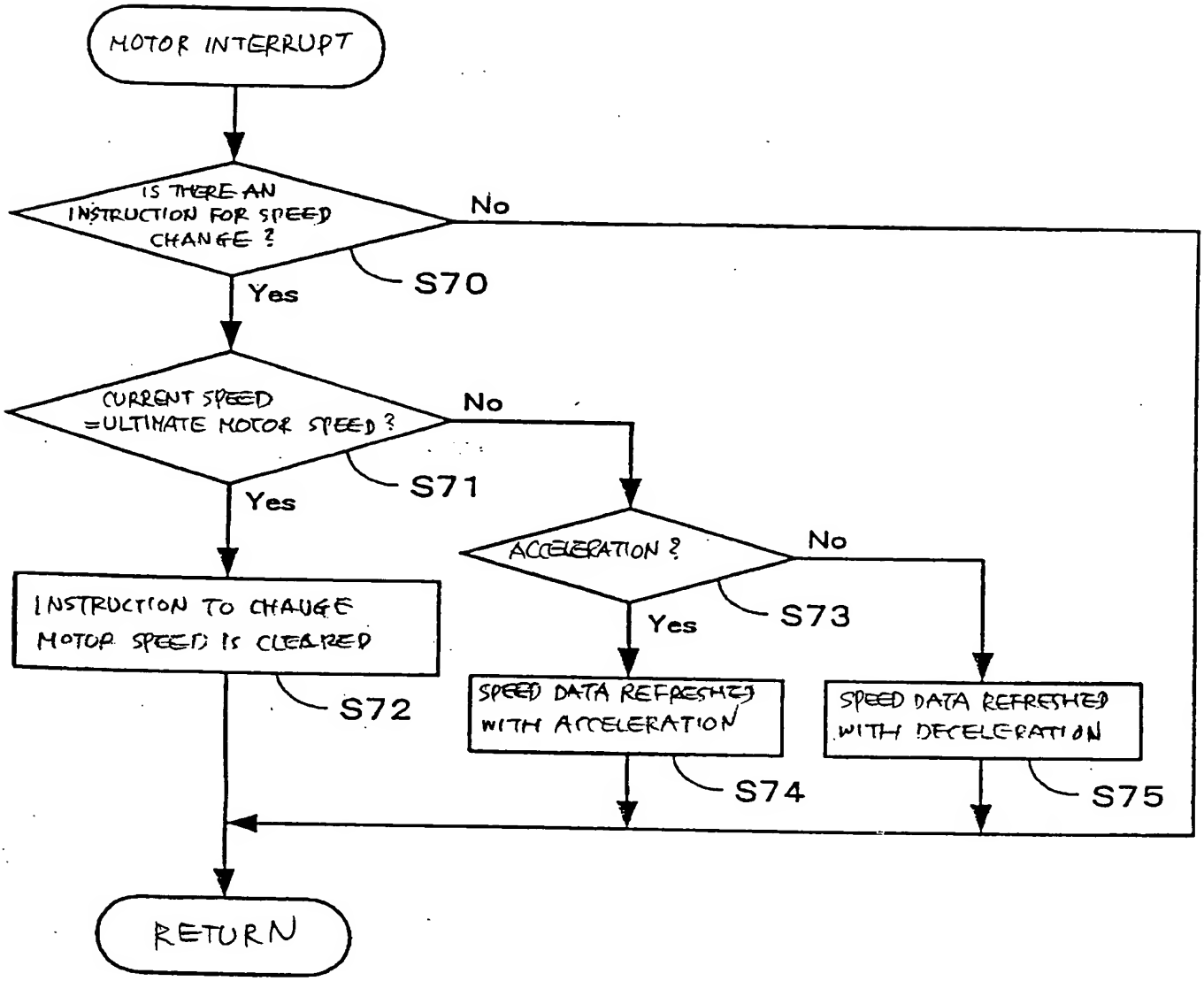
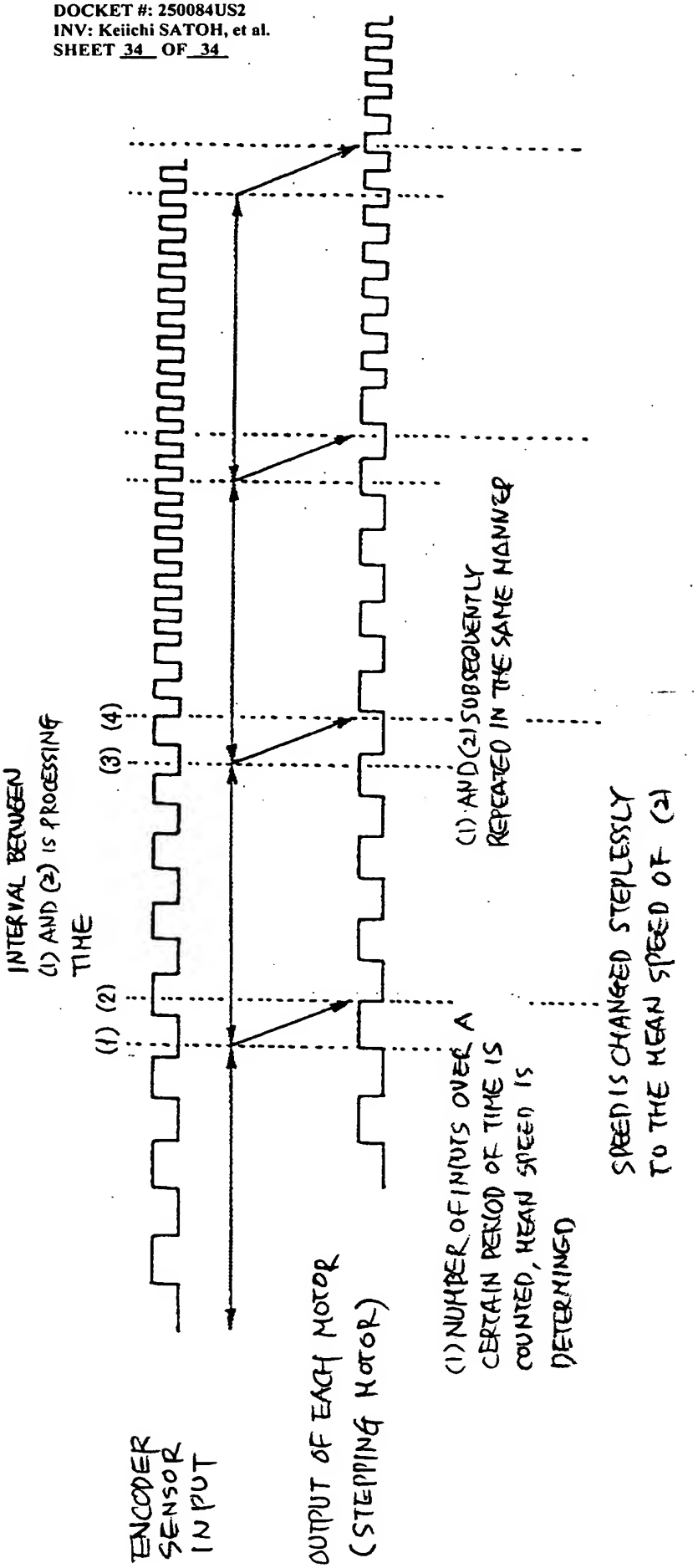

MOTOR INTERRUPT
IS THERE AN INSTRUCTION FOR SPEED CHANGE ?
No
S70
Yes
CURRENT SPEED =ULTIMATE MOTOR SPEED ?
No
S71
Yes
ACCELERATION ?
No
S73
Yes
INSTRUCTION TO CHANGE MOTOR SPEED IS CLEARED
S72
SPEED DATA REFRESHED WITH ACCELERATION
S74
SPEED DATA REFRESHED WITH DECELERATION
S75
RETURN

FIG. 32


INTERVAL BETWEEN
(1) AND (2) IS PROCESSING
TIME
(1)
(2)
(3)
(4)
ENCODER
SENSOR
INPUT
OUTPUT OF EACH MOTOR
(STEPPING MOTOR)
(1) NUMBER OF INPUTS OVER A
CERTAIN PERIOD OF TIME IS
COUNTED, MEAN SPEED IS
DETERMINED
(1) AND (2) SUBSEQUENTLY
REPEATED IN THE SAME MANNER
SPEED IS CHANGED STEPLESSLY
TO THE MEAN SPEED OF (2)